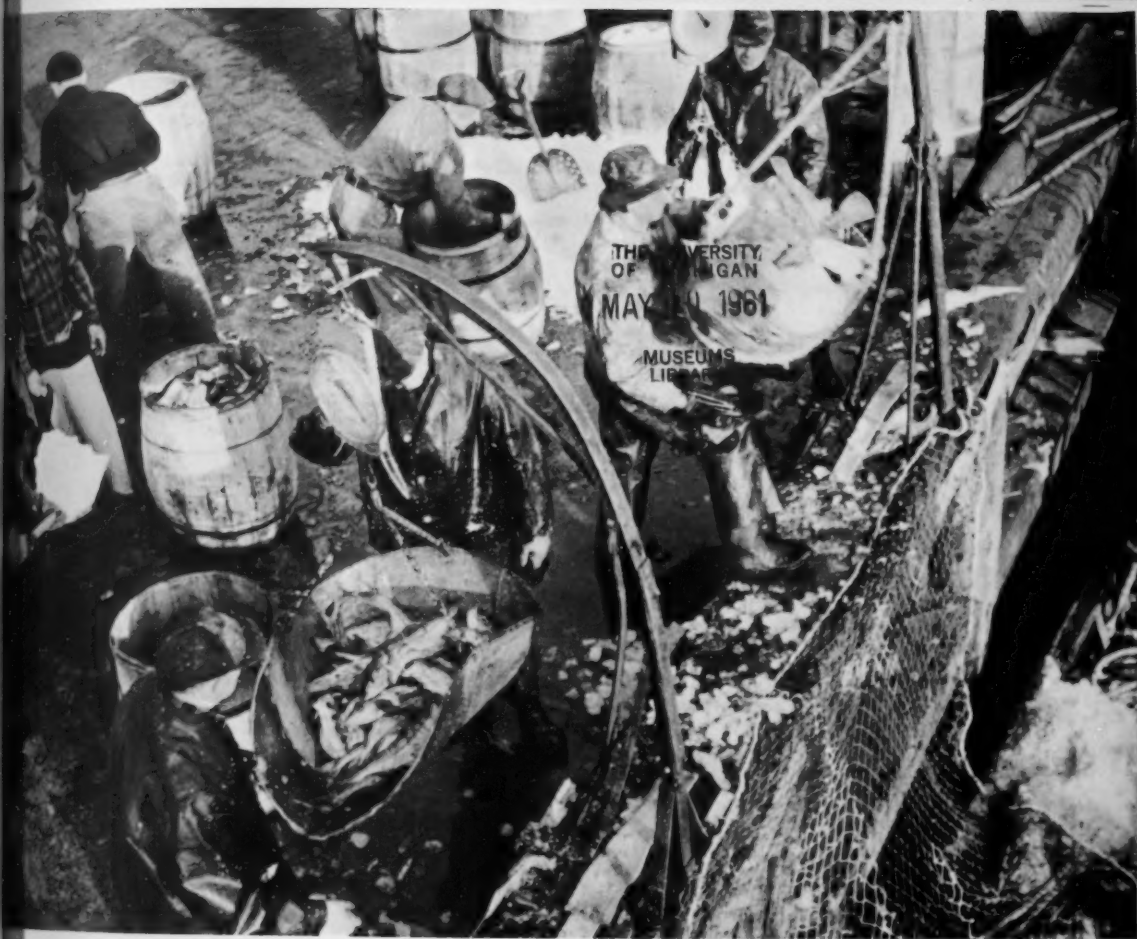


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EXPERIMENTS UTILIZING ELECTRICAL TRAWL CABLES-- A PROGRESS REPORT

By Richard L. McNeely*

SUMMARY

Experiments to adapt special trawl cables containing electrical conductors for use on commercial-size otter-trawling gear have shown a fair degree of progress during the past two years. Since the original installation of electrical cable as part of a depth-telemetering system on the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb in 1958, further experiments utilizing new sensing units have extended the cable's usefulness to indicate water temperature, contact with the bottom, and presence of fish in the net's cod end. Changes in design of the cable have been made by the cable manufacturers to prolong its expected life. Although sufficient durability for commercial use has not been achieved, experiments in utility are being conducted simultaneously with experiments in durability in an effort to make installation of the cable and various sensing units economically feasible for commercial fishing vessels.

BACKGROUND

Trawl cables containing electrical conductors (fig. 1) were used in 1957 as part of a depth-telemetering system in midwater trawling experiments aboard the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb (McNeely 1958). A sensing unit, located on the wing of the trawl, transmitted continuous depth information by way of the electrical cable to a meter mounted in the vessel's pilothouse. This allowed positioning of the net near schools of fish which had been located by echo-sounding. Telemetry of net-depth information was successful, and catches showed a positive correlation with echo soundings that indicated subsurface fish concentrations (Schaefer and Powell 1958).

During the past two years, this depth-telemetering system has been modified for use on otter-trawling gear for simultaneous sensing and transmission of trawl-performance variables to the vessel (fig. 2).

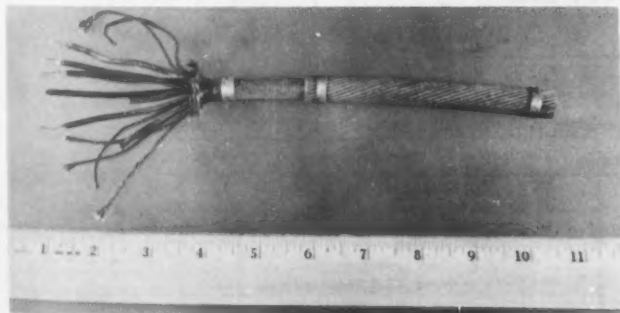


Fig. 1 - Sample of electrical trawl cable used on the John N. Cobb.

*Electronics Scientist, Exploratory Fishing Station, Seattle Wash., Branch of Exploratory Fishing, Division of Industrial Research, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

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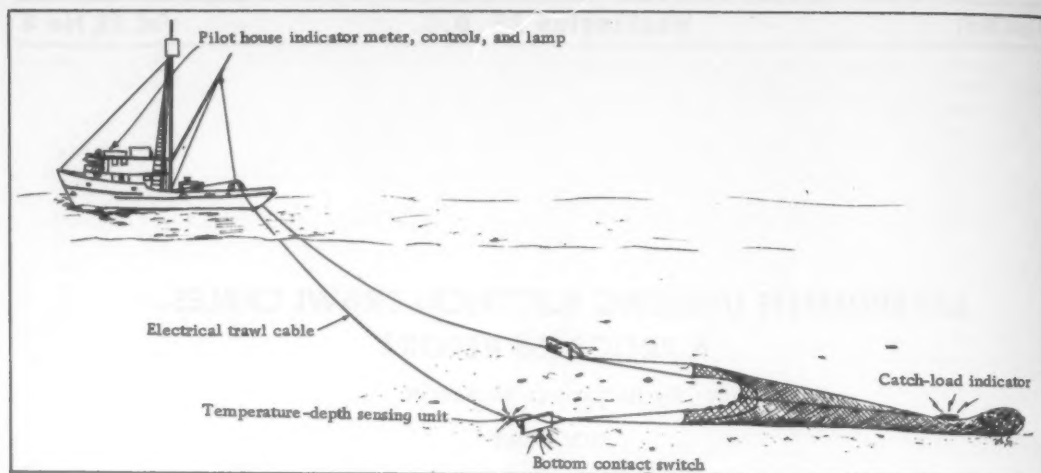


Fig. 2 - Multiple use of trawl cables containing electrical conductors on bottom trawling gear.

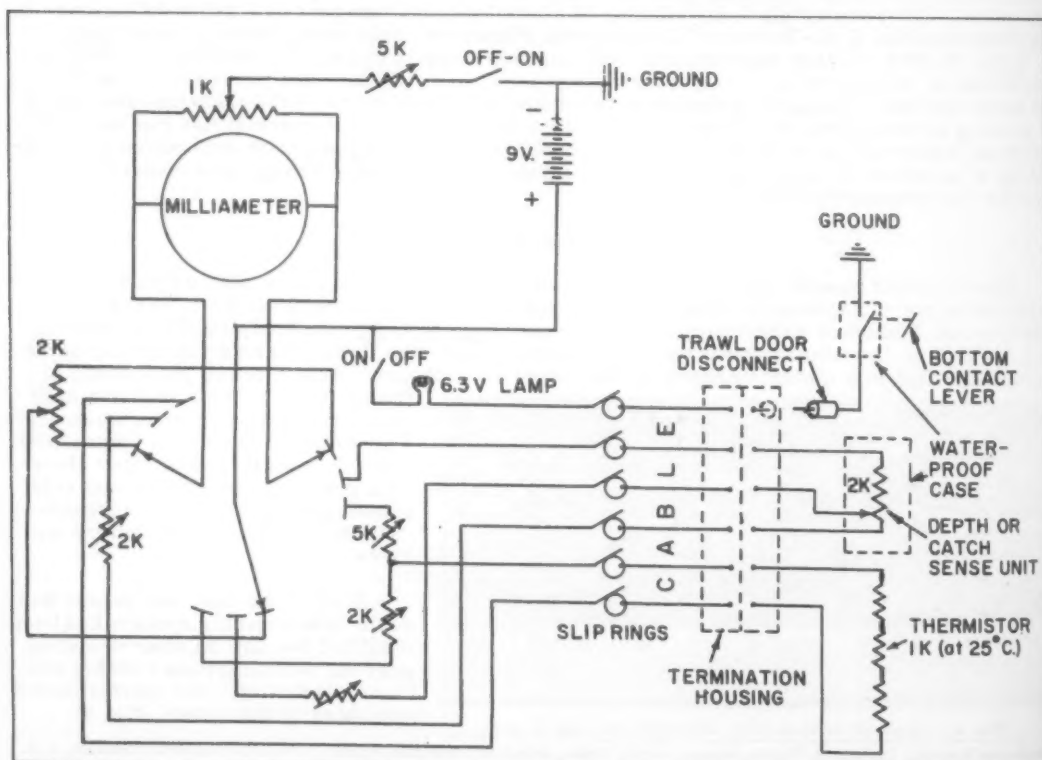


Fig. 3 - Circuit diagram of telemetering system.

SENSING UNITS

Transmission of data from three sensing units, designed during 1959 and 1960, has extended the use of electrical trawl cable to measure temperature, indicate bottom contact (and thereby actual time of fishing), and supply data on fish catches.

TEMPERATURE SENSING UNIT: Constant monitoring of bottom water temperatures was accomplished with a thermistor sensing unit. Three thermistors (figs. 3 and 4) with a nominal resistance value of 1,000 ohms each (at 25° C. or 77° F.) were hooked in series to form one leg of a bridge circuit actuating a meter located in the pilothouse. The thermistors, covered with a thin layer of rubber tape for insulation from salt water, were mounted inside a free-flooded section of either the depth-telemeter-sensing-unit housing or the cable connector.^{1/} The temperature-sensing instrument provides information which could be used for evaluation of fish distribution and abundance as related to water temperature during experimental fishing. Thermometric fishing techniques (Dietrich, Sahrhage, and Schubert 1959) using this unit could eventually be employed by commercial fisheries with probable increase in the catch per unit of effort.

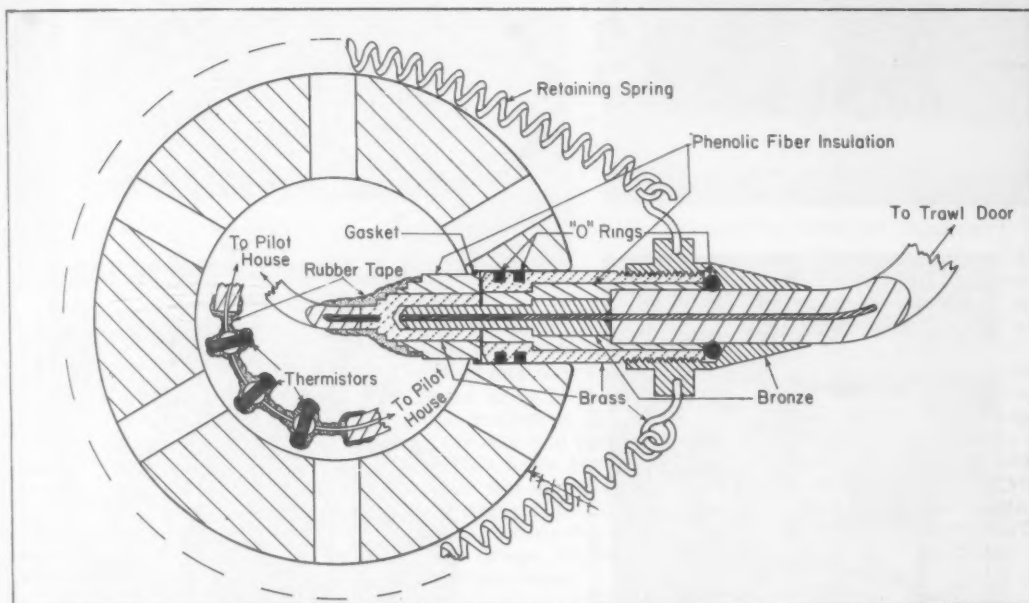


Fig. 4 - Cross-section of trawl door disconnect device.

BOTTOM CONTACT INDICATOR: This unit is designed to indicate when the trawl doors are: (1) on bottom, (2) on rough or irregular bottom, or (3) off the bottom. It is installed on the trawl door and consists of a small castor-oil-filled pressure housing (fig. 5) containing a set of contact points which are actuated by a hinge-type lever placed inside a cut-out section of the trawl-door shoe (figs. 6 and 7). When used with trawls employing dandyline gear, an O-ring-sealed quick-disconnect plug and interconnecting cable are used at the trawl door (figs. 4 and 8).

The unit operates by closing a circuit when the door is in contact with the bottom, causing a lamp to light in the pilothouse. Knowledge of the exact time the net reaches bottom, as well as information on the time the net departs from the bottom, should aid researchers in determining the elapsed fishing time of trawls and make possible more precise evaluation of fish catches.

^{1/} Cable connectors are used whenever it is necessary to extend the electrical trawl cable past the detachable bottom-trawling doors to connect with sensing units located on the net (McNeely 1958).



Fig. 6 - Bottom contact switch lever on small shrimp trawl door.

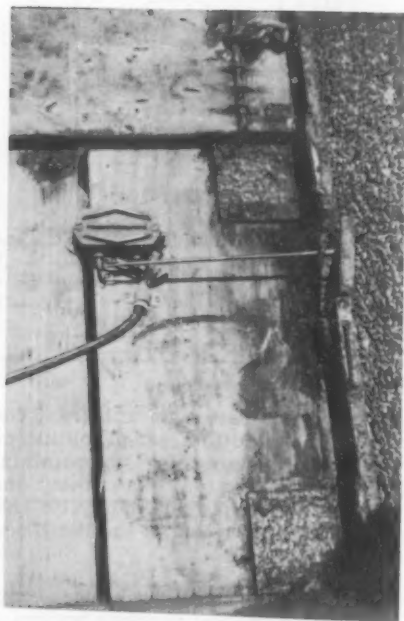


Fig. 5 - Oil-filled bottom contact switch.



Fig. 7 - Bottom contact switch lever on heavy fish trawl door.



Fig. 8 - Disconnect device for trawl door instrumentation.

CATCH-LOAD INDICATOR: A sensing unit (figs. 9 and 10) designed to give continuous information on the quantity of fish caught as the drag progresses was given preliminary tests aboard the John N. Cobb during March and April 1960. This experimental sensing unit was named the catch-load indicator owing to the dual utility of the instrument. In addition to catch information, use can be extended to indicate changes in mesh configuration or strain on the mesh.

The sensing unit for the catch-load indicator consists of a linear-displacement electrical dynamometer, 11 inches long by 1 inch in diameter. It is hermetically sealed in a castor-oil-filled rubber tube protected from external abuse by a free-flooded copper-tube housing. Having no air spaces, the sensing unit is usable at any depth. Electrical continuity from the unit to the electrical trawl cable is provided by threading a $\frac{1}{4}$ -inch, 3-conductor, rubber-covered, interconnecting cable through the webbing and along the riblines to the upper left wing of the net. At this point a waterproof quick-disconnect plug is used to bridge a necessary swivel on the end of the dandyline.

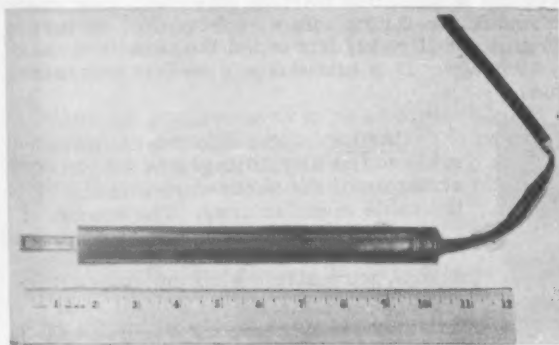


Fig. 9 - Catch-load sensing unit.

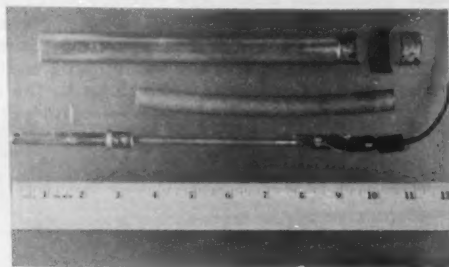


Fig. 10 - Catch-load sensing unit--disassembled.

When mounted perpendicular to the path of the trawl (cross-mesh) at points 1 foot, 2 feet, and 3 feet from the end of the cod end, wide fluctuations of the indicating meter occurred. When the sensing unit was placed one foot from the cod end, a rapid rise in reading was noted when only a few fish were found to be in the net.^{2/} By placing the instrument two feet from the cod end, a reading was not indicated until about 200 pounds of fish were caught. Attachment three feet from the end of the cod end further delayed indication of catches to a point that required about 700 pounds of fish to be in the net before a positive indication could be detected on the meter. When placed in the latter two positions and an initial catch of 200 to 700 pounds respectively was made, a detectable increase in meter indication took place over the remaining span of dragging time, indicating that fish were being caught and also the approximate rate of catch. During these drags, fluctuations of meter readings occurred, which suggested instability of mesh configuration.

Attachment of the sensing unit lengthwise to the meshes of the cod end at various positions from 3 to 8 feet ahead of the end of the cod end gave improved readings more closely corresponding to the fish catch,^{3/} and, although fluctuations still occurred, they were less pronounced. A series of drags with the sensing unit located eight feet from the cod end resulted in relatively stable readings and demonstrated that strain on webbing ahead of the cod end increases as the net loads with fish, and that this change can be detected and shown on a meter in the pilothouse.

CABLE AND CIRCUITRY MODIFICATIONS

Several modifications to the original trawl-cable telemetry system (McNeely 1958) were necessary to extend its use to bottom-trawling gear. The most important changes were made

^{2/}Correlation of catches with meter indications was not attempted beyond noting gross values prior to hauling the net aboard and examining the catch. Towing time of these experimental drags ranged from 10 to 90 minutes.

^{3/}No precise calibration of the meter was made as these tests were of a preliminary nature aimed at gaining design criteria for future units.

in the cable construction, pilothouse circuitry, cable terminations, and the slip-ring-brush assembly.

SLIP RINGS AND BRUSHES: To facilitate transmission of data from multiple-sensing units, the number of slip rings on the winch was increased to six. To accommodate the larger number of slip rings and brushes, ring width was reduced to one-eighth inch leaving a cross-sectional brush-contact area of approximately $\frac{1}{8} \times \frac{1}{4}$ inches. Carbon-filled bronze bushes, $\frac{1}{4}$ inch in diameter, were installed to improve brush wearing quality.

CIRCUITRY: Pilothouse circuitry (fig. 3) was modified to allow use of a 0- to 1-milliamper indication meter having a total pointer travel of $14\frac{3}{4}$ inches through 275°. Battery voltage requirements were lowered from 45 volts to 9 volts d.c. by use of low resistance values in the multiple-sensing units.

CABLE TERMINATIONS: Redesign of the cable termination was necessary to reduce cable conductor breakage which occurred near the termination fairlead when heavy commercial trawling gear was used. Replacement of the fairlead ring with a short socket having a cable support radius of $1\frac{1}{8}$ inches at the emergent end (fig. 11) increased the time interval between conductor failures to approximately 30 drags. This interval was further increased by factory-designed modifications to the cable.



Fig. 11 - Emergent end of cable termination socket.

John N. Cobb has withstood 250 drags of heavy otter-trawling gear. During these drags there has been no indication of conductor failure other than near the cable termination (as previously mentioned). The time interval between conductor failures near the termination was found to be approximately 60 drags when the cable was new, decreasing with usage to approximately 20 drags between failures after 225 drags. At this writing, no breakage of steel strands has occurred. However, a serious problem with the cable was encountered during the last 50 drags. Loosening of the outer strands of the cable (fig. 12) was noted whenever 1,200 feet or more of cable was used. This condition is sometimes referred to as "birdcaging." Although the exact cause of this condition is unknown, three possible causes are suspected:

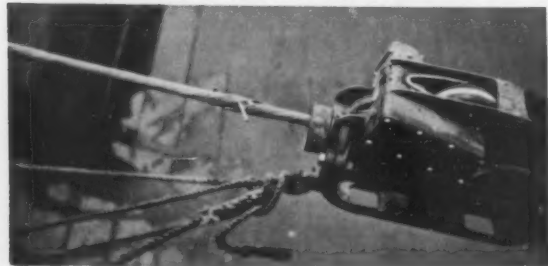


Fig. 12 - "Birdcaging" of electrical trawl cable. Match sticks are inserted to show looseness of strands.

CABLE: In an effort to improve cable reliability, changes in the construction of the cable were effected by the cable manufacturer. The number of copper wires per conductor was increased from 6 to 42 while retaining a No. 22 A.W.G. wire size. A cotton center filler and sheath was added to permit each conductor to work freely within its rubber insulation thereby relieving internal strain and increasing flexibility.

CABLE PERFORMANCE

1. Repeated snagging of the fishing gear on the bottom, in which the forward momentum of the vessel is completely stopped, placing a load on the cable estimated to be in the range of 12,000 to 16,000 pounds.
2. Differential torsional resistance in the two layers of steel strands.
3. "Rolling mill" action on the outer strands during passage through the trawl blocks.

A solution to the first two possible causes seems to entail re-design of the steel cable to provide a larger size with sufficient strength to counter the surges, and the accompanying acute strains, which occur frequently during bottom-trawling operations. A stronger cable does not appear to be a solution if the third possible cause exists.

A report on cable performance has been forwarded to the manufacturer's engineering section for study and recommendations.

COMMERCIAL OUTLOOK

Marine application of many electrical aids has markedly changed fishing-vessel operation in the past few years. Communication, navigation, indication, illumination, and control devices demonstrate the numerous uses of electricity. Electrical trawl cables may also eventually be used on commercial fishing vessels. Although sufficient durability for commercial use has not been achieved, experiments in durability of the system are being conducted simultaneously with experiments in utility. Since the term "sufficient durability" is relative to "utility" it is conceivable that successful development of a particular aid or combination of aids to commercial fishing gear may make the cable readily acceptable in its present stage of development.

Although programmed to be of direct benefit to the commercial fisheries, electrical towing cables also have numerous uses in oceanographic and fisheries research work. The experiments now in progress on the John N. Cobb are providing a foundation upon which private enterprise may build a new phase of the commercial fishing industry.

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INHIBITION OF MOLD ON SMOKED MULLET

By Melvin E. Waters*

ABSTRACT

Modern refrigeration does not completely solve the problem of spoilage caused by bacteria, molds, and yeast. Four to six weeks at 37° F. is considered the maximum storage life for untreated commercially-smoked mullet. In the present study of mold growth on smoked mullet, potassium sorbate was used as a mold inhibitor along with vacuum packaging. In a first test series, potassium sorbate concentrations of 1-percent, 2-percent, and 3-percent were incorporated in the brine-soaking solution. In a second series, a 5-percent potassium sorbate solution was used as a dip prior to packaging. The smoked mullet were stored at 37° F. and examined biweekly. Results showed that smoked mullet can be stored successfully in a vacuum when aseptically packaged, either plain or treated with potassium sorbate, up to 14 weeks and possibly longer.

INTRODUCTION

In early days, salting, drying, smoking, and natural cold were the only means by which fish could be kept for any extended period. Since smoking fish was a means of preservation, little attention was paid to developing a desirable flavor. Today, with modern refrigeration facilities, the primary objective is to produce a product with a flavor that is distinctive.

Many species of fish of southern origin are smoked, producing an excellent product. The species most commonly smoked are mullet, Spanish mackerel, sturgeon, catfish, and flounder. Smoking methods may vary with different species.

Present commercial practices in that area do not utilize either a mold inhibitor or vacuum packaging to extend the storage life of smoked mullet. On the contrary, the fish are wrapped in cellophane with no means of excluding oxygen, which is essential for mold growth.

Development of mold is one of the chief causes of deterioration in smoked fishery products. Modern packaging methods employing special films such as polyethylene in conjunction with vacuum packaging have greatly reduced microbial spoilage. Frequently, in packaged fish, however, the sharp fins puncture the bags thereby releasing the vacuum. The hole permits entrance of microorganisms that grow well in the presence of air.

Sorbic acid was reported by several workers to retard mold growth on species of fish such as salmon, halibut, and sablefish (Boyd and Tarr 1955). In this experiment potassium

* Fishery Products Technologist, Technological Laboratory, Division of Industrial Research, U. S. Bureau of Commercial Fisheries, Pascagoula, Miss.



Fig. 1 - Scientist inspecting fish for mold development.

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sorbate, a derivative of sorbic acid, was used to inhibit mold growth on smoked mullet. It thus was easy to apply as an aqueous dip or to incorporate in the brine. (Since mold thrives on moisture, however, the fish must be thoroughly dry before being packaged.)

Wood smoke has long been known to protect fish from bacterial and mold spoilage. Among the chemical constituents of the wood smoke causing this preservative action are carbon dioxide, formaldehyde, formic acid, acetic acid, methane, acetone, methyl and ethyl alcohols, and various phenols (Linton and Dyer 1946). In addition to the preservative action of the smoke, hot smoking temperatures of 130° to 180° F. produce a product with a very small microbial population.

Mold requires oxygen to live and reproduce. Vacuum packaging lowers the amount of oxygen sufficiently to cause molds to remain dormant.

When potassium sorbate solutions are applied to fish, the potassium sorbate hydrolyzes to sorbic acid thereby giving protection to the product. Researchers at Charles Pfizer and Company (1955) noted that dehydrogenation of fatty acids to the unsaturated fatty acids is one phase in the growth of molds in foods. This is accomplished by a dehydrogenating enzyme system, and without this reaction, the mold cannot reproduce. Potassium sorbate is an unsaturated fatty acid similar to those formed in the enzymatic dehydrogenation reaction, and when present in excess of the amount produced by the reaction, it tends to inhibit the reaction and, consequently, the growth of mold.

Potassium sorbate was preferable to sorbic acid because of its solubility in water. As stated above the potassium sorbate eventually hydrolyzes to sorbic acid. Various concentrations of the agent were necessary to determine the most effective level and yet be economical enough for commercial use.

It was desirable to compare adding potassium sorbate before and after smoking to determine the most economical and effective method of application. Potassium sorbate was also tested for its effectiveness under good and poor sanitary conditions.

Mold not only changes the flavor of the product but also produces undesirable changes in appearance. These factors result in great economic loss to the fishing industry and the consumer. The present project was therefore started to study the effect of (1) simulating commercial conditions, (2) soaking mullet in various concentrations of potassium sorbate prior to smoking, and (3) dipping mullet in a potassium sorbate solution after smoking.

EXPERIMENTAL PROCEDURES AND RESULTS

Mullet used in this experiment were purchased from a local dealer and were in excellent condition. They were caught 12 hours prior to processing.

The smoking procedure was carried out in a laboratory-scale smokehouse designed at this laboratory (Waters and Bond 1960). The design permits fairly accurate control of smoke temperature.

Three procedures were used as shown in the flow chart of figure 2. Details of the experiments follow:

EXPERIMENT 1: Procedure 1 - Preliminary study simulating commercial condition. Fish used in this experiment were packaged using commercial methods to determine the maximum storage life of commercially-smoked mullet. Packaging consists of cellophane-wrapped and vacuum-packaging in bags. This group was divided into four lots and treated as follows:

1. Lot A--Brined in 10-percent salt (37.7 salometer reading).
2. Lot B--Brined in 10-percent salt, plus 1-percent potassium sorbate.
3. Lot C--Brined in 10-percent salt, plus 0.1-percent butylated hydroxytoluene.

potassium sorbate incorporated in the brine solution. Storage life, economics of application, and concentration of solution were studied. The fish were divided into the following four classifications according to the types of brining solution:

1. Control--ten percent salt (37.7 salometer reading).
2. Solution 1--ten percent salt, plus 1-percent potassium sorbate.
3. Solution 2--ten percent salt, plus 2-percent potassium sorbate.
4. Solution 3--ten percent salt, plus 3-percent potassium sorbate.

Four packs of 20 mullet, approximately $\frac{1}{2}$ pound each, were immersed for 60 minutes in the above solutions and drained 30 minutes at room temperature. They were then smoked with pecan wood smoke for 12 hours at 130° to 180° F. The fish were removed from the smoke-house nearly sterile because of being subjected to 180° F. smoke. They were aseptically placed in bags using gloves that had been sterilized by immersion in boiling water. Theoretically, the product was still nearly sterile. A vacuum (29 inches) was pulled on the bags to exclude the oxygen. The fish were stored at 37° F. and inspected visually for mold growth at 2-week intervals.

Results 2 - After a few days storage, the vacuum was lost, apparently owing to fish fins puncturing the bags. Even so, controls and treated fish of all three concentrations of potassium sorbate showed no growth of mold after storage for 14 weeks at 37° F. The moisture content varied somewhat within the controls and within the treated fish. No mold developed on these moist samples, however, even when the vacuum had been released. After 14 weeks of storage, all the bags (controls and treated fish) were opened at one end, contaminated by handling, and left exposed to 37° F. atmosphere. The controls began to mold in 7 days, and soon, the product in all the control packages was moldy. The treated fish remained free of mold after 21 days of exposure to the atmosphere. This finding illustrated the effectiveness of potassium sorbate in suppressing the growth of mold even when the package becomes punctured and the food is exposed to the atmosphere. This portion of the experiment was terminated, as it was apparent that the treated fish would not mold within the period of extension of storage life desired by the industry.

EXPERIMENT 3: Procedure 3 - Dipped in potassium sorbate after smoking. This method was expected to deposit 0.05-percent to 0.1-percent of the agent on the surface of the fish to prevent the growth of mold if the bag became punctured. The fish were packaged under sanitary conditions. They were divided in two parts according to the type of dipping solution:

1. Control--no potassium sorbate.
2. Solution 1--five percent potassium sorbate (no salt).

The control consisted of 20 fish, approximately $\frac{1}{2}$ pound each, soaked 60 minutes in a 10-percent salt solution. The fish were well drained and smoked 12 hours with pecan wood smoke at 130° to 180° F. They were removed from the smokehouse and packaged in bags using aseptic techniques. The packages were stored at 37° F. and examined biweekly.

Another group of fish were processed the same as the control except that the fish were dipped in a solution (5-percent potassium sorbate), drained 15 minutes at room temperature, and aseptically packaged in bags. They were stored at 37° F. and examined biweekly.

Results 3 - Controls and fish dipped in a 5-percent potassium sorbate solution remained free of mold growth after 13 weeks of storage at 37° F. Again the bags lost the vacuum, but still no mold appeared. The bags were opened, contaminated, and exposed to the atmosphere for the remainder of the experiment. The fish were examined every 2 or 3 days. Controls began to mold in 7 days, but the treated fish did not show growth of mold in 30 days of exposure. This finding again demonstrated the effectiveness of potassium sorbate in inhibiting the growth of airborne mold spores. The experiment was terminated at this point.

DISCUSSION

Results of these experiments show that aseptic handling and packaging is of utmost importance. When packaged with conventional handling, the fish become moldy in 6 to 8 weeks. When aseptic techniques were employed, along with vacuum packaging, smoked mullet was successfully stored up to 14 weeks without development of mold.

Potassium sorbate is an antimycotic or fungistatic agent insofar as it does not kill molds but inhibits their growth by blocking their metabolism. Heavily contaminated foods or foods prepared under poor sanitary conditions will not benefit from the use of potassium sorbate.

Good sanitation is a must in plants processing perishable foods. The extreme perishability of fish and the necessity for much hand-processing increase the need for good sanitation. The plant and its furnishings, equipment, processing practices, and personnel must meet certain minimum sanitary requirements, including those of the Food and Drug Administration.

SAFETY REQUIREMENT

The spores of *Clostridium botulinum* are ubiquitous and airborne. They are extremely difficult to exclude from any food-packaging process. This bacteria's spores will germinate and produce toxin, however, only under certain conditions: (1) a low oxygen tension such as in a vacuum package, (2) presence of a suitable media such as moist protein, and (3) presence of a suitable temperature, usually quoted by authorities as 77° to 98° F. These conditions apply to any food and not only to smoked fish. The usual cautions to keep under refrigeration, therefore, apply to this as to other foods such as canned ham and cooked turkeys packed in polyethylene films.

CONCLUSIONS AND RECOMMENDATIONS

Treated smoked mullet stored at 37° F. for 14 weeks were served to a taste panel of local citizens. The only criticism was that the fish had a very slight rancid taste. They nevertheless were well accepted.

Soaking in a potassium sorbate solution prior to smoking the mullet was more economical than the dip method. Dipping and draining is another step in the process that is time consuming. Inhibitor results were the same for both methods. Since the fish treated with 1-percent, 2-percent, and 3-percent potassium sorbate did not mold, a 1-percent solution as a pre-smoke treatment is recommended from a cost standpoint.

This study indicates that careful sanitation with aseptic handling, followed by vacuum packaging, will produce smoked fish with a storage life of 14 weeks or more. Although untreated mullet did not become moldy, it is suggested that a 1-percent potassium sorbate be used as added protection to the fish if the bag becomes punctured and exposed to the air. Storage at 37° F. is another factor insuring against rapid development of mold.

By extending the storage life of smoked mullet, reduced returns and extended lines of distribution should more than compensate for the cost of additional sanitation care, vacuum packaging, and addition of potassium sorbate.

SUMMARY

One group of mullet was smoked to simulate commercial practices in handling and packaging. Another pack was smoked using three different concentrations of potassium sorbate

in a 10-percent salt solution as a presmoke treatment. A third pack was smoked using a 5-percent potassium sorbate solution (no salt) as a dip prior to packaging. The control consisted of soaking the mullet in a 10-percent brine prior to smoking. The fish were left in their respective solutions for 1 hour. They were then drained 30 minutes before being smoked with pecan wood smoke at 130° to 180° F. The first group was divided into halves; one-half was wrapped in cellophane and the other half was vacuum packaged. The second and third groups were aseptically vacuum packaged in bags and stored at 37° F. The maximum storage life of the first group was 8 weeks. The other two variations were examined every 2 weeks up to 14 weeks of storage. No mold developed on any of the mullet in those two groups. At this point, it was decided to open all the bags and expose the mullet to the atmosphere to determine if potassium sorbate was effective in inhibiting mold growth. Mold appeared on the opened controls after 7 days of exposure, but treated fish remained free of mold for at least 21 days after exposure.

A caution is given in regard to the development of Clostridium botulinum. The growth of this organism on any food product seriously menaces public health.

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SCKEYE SALMON USE THE SKIES TO NAVIGATE

Early sea captains and desert wanderers may have been the first humans to discover celestial navigation, but apparently the fish beat them to it. Evidence that sockeye salmon use the skies and the stars to orient themselves while migrating has been found by scientists of the Fisheries Research Board of Canada at its Biological Station at Nanaimo, B. C.

Observations on adult salmon have produced evidence that migration is limited to particular pathways at particular times, and the influences of daily, lunar, and seasonal cycles in activity or behavior, of weather changes, and of hydrodynamic forces have been substantiated.

Experimental studies on orientation in sockeye smolts has indicated consistent directional tendencies when visions of only the sky is permitted; over-cast skies or artificial covering has resulted in the fish pointing in random directions.

Moonlight, sunset after-glow, or even city lights may interfere to some extent, but the studies indicate that celestial orientation is an essential component for the successful migration of the sockeye out of lakes and towards the sea. (Canadian Trade News, January 1961.)

TRENDS AND DEVELOPMENTS

Byproducts

UNITED STATES FISH MEAL AND SOLUBLES SUPPLY AND FISH OIL PRODUCTION, 1959-60:

During 1960 (based on preliminary data), the United States production of fish meal and scrap amounted to 285,000 tons--a drop of 7.0 percent from the 306,551 tons produced in 1959. Imports of fish meal and scrap in 1960 of 131,561 tons were down 1.0 percent from the 132,925 tons imported in the preceding year. The over-all supply (domestic production plus imports) declined about 5.2 percent or 22,915 tons from 1959 to 1960.

Table 1 - United States Supply of Fish Meal and Solubles, 1959-60

Product	1960	1959 ^{2/}
.. (Short Tons) ..		
Fish Meal and Scrap:		
Domestic Production:		
Menhaden	218,123	223,893
Tuna and mackerel	1/ 26,000	25,380
Herring, Alaska	6,071	8,094
Other	1/ 34,806	49,184
Total Production	1/ 285,000	306,551
Imports:		
Canada	30,982	39,033
Peru	68,156	49,923
Chile	21,183	5,104
Angola	888	20,738
Union of South Africa	7,073	9,727
Other countries	3,279	8,400
Total Imports	131,561	132,925
Total Fish Meal Supply	416,561	439,476
Fish Solubles (Wet Weight):		
Domestic Production ^{3/}	99,605	165,359
Imports:		
Canada	869	1,660
Denmark	1,858	18,723
Other countries	447	6,247
Total Imports	3,174	26,630
Total Fish Solubles Supply	102,779	191,989

1/Partly estimated.

2/Revised

3/Includes production of homogenized-condensed fish.

The 1960 production of fish solubles, due to a very poor market for this product, dropped (39.8 percent) sharply to 99,605 tons from the 165,359 tons produced in 1959. The decline in the 1960 imports of fish solubles was even more pronounced--from 26,630 tons in

1959 to 3,174 tons in 1960 or about 88.1 percent.

Table 2 - United States Production of Marine-Animal Oil, 1959-60

Product	1960 ^{1/}	1959 ^{2/}
	(1,000 U. S. Gallons)	
Menhaden	23,675	20,628
Herring	1,195	1,959
Tuna and mackerel	598	601
Sardine, Pacific	162	188
Other (including whale oil)	1,059	1,569
Total	26,689	24,945

1/Preliminary.

2/Revised.

The United States production of marine-animal oils in 1960 increased 7.0 percent to about 26.7 million gallons from the 24.9 million gallons produced in 1959. The higher production in 1960 was due entirely to an increase in the production of menhaden oil. Although landings of menhaden in 1960 were somewhat lower in 1960 than in 1959, the catches reportedly were made up of larger and fatter fish, resulting in a relatively high oil yield.

Note: Also see *Commercial Fisheries Review*, March 1960, p. 16.



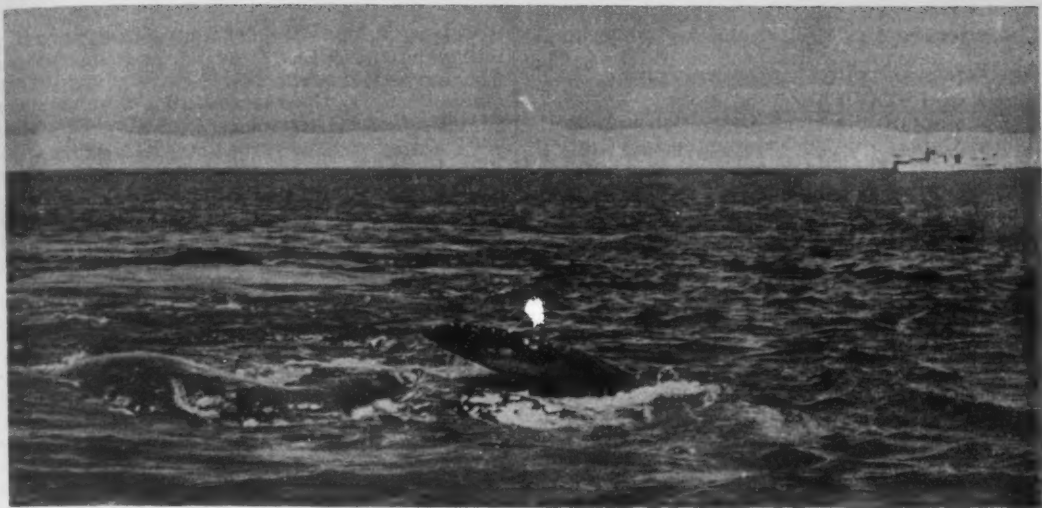
California

PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 61-1-Pelagic Fish:
The inshore area from the United States-Mexican Border to Bolinas Bay, Calif., was surveyed from the air (January 16-18, 1961) by the California Department of Fish and Game Cessna "182" 9042T, to determine the distribution and abundance of pelagic fish schools.

Warm, clear weather made it possible to cover the entire survey area, and optimum conditions of visibility prevailed throughout the three-day period.

Only 27 fish schools were seen. All were small and none were found north of Port Hue-



Pair of gray whales rolling and roiling at the surface preparatory to mating off Scammon Lagoon, Baja Calif.

neme. Nine sardine schools were observed five miles southwest of San Clemente City. Eight Pacific mackerel schools were seen two miles off Torrey Pines. Four small anchovy schools were counted one mile off El Segundo, and six more were located one mile west of Port Hueneme.

A total of 117 southbound gray whales was seen. The largest number (40) was observed between Point Piedras Blancas and Point Sur traveling singly and in "pods" of up to nine individuals.

In addition to the gray whales, a group of approximately 50 smaller whales identified as Pacific pilot whales (*Globicephala scammoni*) was seen two miles west of Point Vicente.

Note: Also see *Commercial Fisheries Review*, March 1961 p. 22.

* * * * *

SALMON SPAWNING RUN IN CENTRAL VALLEY AREA:

The Sacramento-San Joaquin River systems of California's Central Valleys had another large salmon spawning run during the 1960/61 season, according to estimates of California's Department of Fish and Game.

There were about 485,000 spawners, slightly more than in the 1959/60 run. The record for this decade was 597,000 spawners in 1953.

The Department figures about a half million salmon spawners are needed to maintain the commercial and sports fisheries at a high level. The 1960/61 run closely approaches this and is the largest since 1953. Distribution of the spawning runs differed from last year,



Department spokesmen said. The Sacramento River proper and its upper tributaries had a slightly lower salmon spawning population this season than last. On the other hand, the run on the Feather River was larger. The Yuba River population was nearly twice as large as last season and the American River's spawning run was also larger.

Spawner estimates for the Sacramento River system totaled almost 428,000 and for the San Joaquin River system 57,000 for the 1960/61 season.

The spawning survey is made each year, beginning late in September. Information from these surveys helps in drawing up the salmon fishery regulations and will provide information to help evaluate and compensate for water project developments affecting salmon.



Chicago

RECEIPTS OF FRESH AND FROZEN FISHERY PRODUCTS, 1960:

Receipts of fresh and frozen fish and shellfish at Chicago in 1960 amounted to 87 million pounds. The 6-percent drop in quantity from the previous year was not wholly unexpected. The supply trend for certain Great Lakes species during the year showed signs of a decline. On the other hand, receipts from Canada's interior lakes were at a fairly good rate.

Receipts of most of the frozen salt-water species held up well as compared with the previous year. The more pronounced drop in shellfish products receipts was confined to frozen raw headless shrimp and spiny lobster tails. Receipts of other major shellfish items were about the same, or surpassed those of the previous year.

Fresh-water fish receipts of 37 million pounds in 1960 were 6 percent lower than the previous year. Receipts of fresh and frozen whitefish totaled more than 8 million pounds--only slightly less than in 1959. The principal whitefish suppliers were the Provinces of Alberta and Manitoba which combined supplied nearly 7 million pounds of whitefish receipts. Minnesota led all other domestic sources in whitefish supplies for the Chicago market. Receipts of this species from several domestic Great Lakes-producing areas were only about one-half the previous year's volume. The 1960 lake trout receipts from all shippers dropped sharply from the previous year. Supplies of this species marketed at Chicago during the year were much less from both domestic and Canadian shippers.

The year's yellow pike receipts were lower than in 1959 with an almost conspicuous absence of this species from Lake Erie. During 1960, Minnesota shippers provided the Chicago market with more yellow pike than any other source.

A marked drop in the production of yellow perch in most areas of the Great Lakes in 1960 was seen in the year's receipts of this species at Chicago. Yellow perch receipts were down one-third, or one million pounds below the 1959 receipts--a sharper drop in quantity than any other fresh-water species. Wholesale prices for yellow perch at Chicago were fairly low in April-May but advanced steadily during the remainder of the year.

Receipts of fresh and frozen yellow perch fillets were cut in half from the previous year. Frozen yellow perch fillets were virtually nonexistent during the last half of 1960 and prices remained high.

Lake herring receipts were the lowest in five years reflecting the production trend of that commercial fishery during the year. The 1960 receipts of buffalofish, catfish, and chubs surpassed those of the previous year. Buffalo-fish receipts in 1960 set a new record since 1956.

The 1960 fresh and frozen salt-water fish receipts of more than 25 million pounds registered a smaller volume decline than the other classifications. Leading items were frozen halibut, ocean perch fillets, whiting, and salmon. There was an increase in ocean perch fillets, and some gain in flounder, sole, and haddock fillets as compared with 1959. Receipts of frozen cod fillets compared favorably with the previous year, while pollock fillets dropped to an all-time low. Frozen halibut receipts were only slightly lower than in 1959. Volume of dressed halibut was below the previous year but was offset by a substantial increase in receipts of processed halibut such as steaks and portions.

Frozen salmon receipts were lower for all varieties, particularly silver or coho salmon which dropped 30 percent from the previous year. Wholesale salmon prices were high in 1960 and continued to rise throughout most of the year. More iced fresh red snapper was received during the year, and there was a marked increase in receipts of imported frozen red snapper fillets.

Lower frozen raw headless shrimp receipts in 1960 and a nearly one-million-pound decrease in receipts of spiny lobster tails were responsible for a 10-percent decline in the year's shellfish products receipts. Wholesale shrimp prices were mostly steady during the first half of 1960 and gradually dropped in the late summer and fall months, but not to the extent that they dropped in the same period the previous year. Processed shrimp receipts at Chicago continued to climb in 1960 and included more of the peeled and deveined product.

More frozen sea scallops were received in 1960 than the previous two years. Warehouse stocks were heavy during the summer months when prices started sliding. An intensive

promotional program succeeded in clearing surplus stocks. Despite the relative scarcity of oysters at production areas during the year, receipts of shell and shucked stock held up well. Markets in 1960 were firm for practically all varieties of spiny lobster tails. Preferred sizes and some of the more favored varieties were scarce--wholesale prices for this product were even higher than the record 1959 prices.

A total of 320 carload shipments of fresh and frozen fishery products was received at Chicago in 1960--a 33-percent drop compared with the 1959 carload deliveries. British Columbia accounted for 163 cars, followed by the Province of Alberta with only 78 cars. Car shipments received from Alberta in 1960 dropped to one-third the 1959 car receivings. The trend toward truck transportation from Alberta was started in 1959 when rail express carload receipts declined in favor of truck hauling. In that year trucks hauled about 10 percent of the total receipts from that Province while



rail express moved 85 percent. The transportation picture on receipts from Alberta in 1960 was sharply reversed with trucks hauling about 60 percent of the year's total receipts while rail express volume dropped to about 25 percent. The remaining 10 percent was made up of frozen fresh-water fish moved by rail freight.

Carload receipts from the State of Washington during 1960 increased 30 percent. Other sources of car shipments were Arizona ports of entry with frozen Mexican west coast shrimp, Saskatchewan, and the Maritime Provinces. A sharp drop in car shipments from Saskatchewan during the year was also due to the more extensive use of trucks. A good part of Saskatchewan-produced fish during 1960 was transshipped to Chicago by truck through Winnipeg dealers.

The 1960 receipts at Chicago were at their peak in March when nearly 9 million pounds of fresh and frozen fish and shellfish was received. March was noteworthy for receipts of frozen marine fish and exceptionally good receipts of frozen shrimp and spiny lobster tails. Receipts in March were at a high level for ocean perch and other groundfish fillets, halibut, fish sticks, and whiting. To-

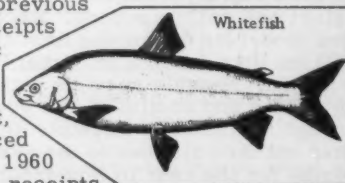
tal monthly receipts fell off in April and May but started to increase with the steady increase in fresh-water fish receipts through September. Receipts were lower in the last two months of the year but did not drop to the 1960 low point of April-May.

Lake Trout: Fresh and frozen lake trout receipts (including fillets) during the year amounted to only 1.6 million pounds. Iced lake trout receipts of slightly more than one million pounds dropped 30 percent from the previous year--28 percent was from domestic Great Lakes production and 72 percent from Cana-



dian shippers. The considerably lower iced fish receipts were partly offset by a sizable increase in receipts of frozen Canadian lake trout fillets, and more frozen dressed fish than in 1959. The bulk of Canadian supplies came from Alberta and Manitoba shippers. Lake trout receipts at Chicago were at a peak during August-September when Canadian fish was dominant. Wholesale prices at Chicago were high throughout the year, and rose to higher levels during the Jewish Holidays than in 1959. Canadian lake trout at various times commanded prices nearly equal to those obtained for domestic fish.

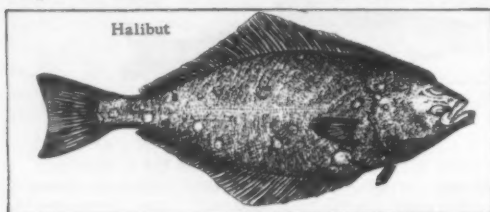
Whitefish: This species continued as the leading fresh-water variety at Chicago in 1960. Canadian fish from the numerous interior lakes again were the mainstay of whitefish supplies for the Chicago wholesale market. Canada shipped more iced whitefish in 1960 than the previous year while receipts from domestic Great Lakes areas dropped 30 percent, the same as iced lake trout. In 1960 iced whitefish receipts



consisted of only 10 percent from domestic production and 90 percent from Canada. Receipts of frozen dressed whitefish and whitefish fillets increased modestly from the previous year. Receipts of whitefish were moderate during the first quarter of the year but slumped in April when they were the lowest for the year. Receipts climbed steadily with

the start of Canadian summer-fishing operations reaching a high point in July and September. They dropped sharply from the September high but were at a moderate level in the closing months of the year. Markets were almost consistently strong for Great Lakes whitefish. Prices for the Canadian variety were about the same or higher than in 1959 and did not decline to the lows of some periods during that year.

Halibut: Frozen halibut (including fillets, steaks, and portions) stood out as the principal salt-water species received at Chicago, the same as in the past score of years. Receipts of more than 7 million pounds for the



year were about comparable to the 1959 arrivals. Iced fresh halibut for the Chicago market has become past history. The negligible amount received in 1960 was far less than the small quantity marketed during the 1959 season. A trend observed in the frozen halibut market during the year indicated some Chicago distributors did not stock up to the extent of former years. Adequate supplies to fill orders and meet firm commitments were drawn on from West Coast suppliers as occasion demanded thus eliminating local month-to-month storage charges.

Frozen halibut receipts in January 1960 dropped sharply from the December 1959 high of one million pounds. Receipts averaged moderate during the first quarter of 1960 but dropped to a low point for the year in March. Monthly receipts picked up starting in May and continued at a good rate through September. Receipts dipped in October but then climbed to the next highest volume for the year in November. Market conditions for this product were intermittently slow and demand lagged at various times of the year. Frozen halibut wholesale prices

at Chicago were lower during a good part of 1960 than the previous year, but advanced to firmer ground toward the end of the year as compared with the same period in 1959.

Shrimp: The 1960 frozen shrimp receipts at Chicago totaled more than 15 million pounds, often approaching a monthly volume of close to 2 million pounds. Receipts were highest in March when nearly one million pounds each of frozen raw headless shrimp and processed shrimp were reported. October receipts were outstanding as the year's largest monthly volume of the raw headless product, but also receipts of breaded shrimp were reported. Processed shrimp receipts at Chicago during the year averaged one-half million pounds a month. The demand for processed shrimp (breaded, peeled, and deveined) continued to increase in 1960 in step with the increase in United States production. (Excerpted from "December 1960 Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends.")



--G. A. Albano, Supv. Mkt. News Reporter,
Fishery Market News Service,
Chicago, Ill.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, 1956-60:

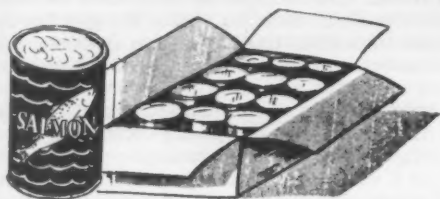
Fresh and Frozen: In 1960 purchases of fresh and frozen fishery products by the Military Subsistence Supply Agency for the use of the Armed Forces amounted to 22.9 million pounds, valued at \$11.8 million. This was 1.2 percent more in quantity and about 1.8 percent more in value as compared with 1959. Prices paid for fresh and frozen fishery products in 1960 by the Agency averaged 51.7 cents a pound, 0.4 cent a pound more than the 1959 average of 51.3 cents a pound. For the 5-year period 1956-60, purchases varied between a high of 26.6 million pounds in 1956 to a low of 22.5 million pounds in 1958. Average prices per pound varied from a low of

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, 1956-60

1960		1959		1958		1957		1956	
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000
22,917	11,839	22,651	11,624	22,511	12,850	23,452	12,080	26,610	13,413

50.4 cents a pound in 1956 to a high of 57.1 cents a pound in 1958. The annual yearly average price per pound in 1957, 1959, and 1960 varied less than one cent a pound.

Canned: Purchases of canned fishery products in 1960 rose sharply from the preceding year due to an increase in the purchases of canned salmon, principally because



more was packed in that year. Canned salmon purchases jumped 231.2 percent, or from 1.1 million pounds in 1959 to 3.6 million pounds in 1960. Purchases of canned tuna

Agency. This exceeded the quantity purchased in December 1960 by 8.9 percent and was 24.0 percent higher than the amount purchased in January 1960. The value of the purchases in

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, January 1961 with Comparisons

QUANTITY			VALUE		
January	Jan.-Dec.		January	Jan.-Dec.	
1961	1960	1960	1961	1960	1960
(1,000 Lbs.)			(\$1,000)		
1,856	1,497	22,917	925	737	11,839

January 1961 was up 11.2 percent as compared with December 1960 and 25.5 percent above the value of the purchases made in January 1960.

Prices paid for fresh and frozen fishery products by the Department of Defense in January 1960 averaged 49.8 cents a pound, 1.0 cent above the 48.8 cents paid in December 1960 and 0.6 cents more than the 49.2 cents paid in January a year ago.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, 1956-60

Product	1960		1959		1958 ^{1/}	1957 ^{1/}	1956 ^{1/}
	Quantity	Value	Quantity	Value	Quantity		
	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	(1,000 Lbs.)		
Tuna	3,610	1,613	3,698	1,672	5,884	2,711	3,334
Salmon	3,593	2,436	1,085	737	3,336	3,111	2,798
Sardines	147	61	1,051	177	253	215	236
Total	7,350	4,110	5,834	2,586	9,473	6,037	6,368

^{1/}Value unavailable.

(3.6 million pounds) in 1960 were about unchanged from the 3.7 million pounds bought in 1959. Canned sardine purchases of 147,000 pounds in 1960 were much lower than the million pounds or more purchased in the preceding year. However, canned sardine purchases in 1959 were abnormally high due to the experimental purchase of California sardines. There was a good pack of California sardines in 1959, but in 1960 the pack was small. In 1960 purchases of both canned salmon and sardines followed the normal pattern established over the past five years.

Note: Also see *Commercial Fisheries Review*, April 1960 p. 22.

DEPARTMENT OF DEFENSE PURCHASES, JANUARY 1961:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, 1.9 million pounds of fresh and frozen fishery products were purchased in January 1961 by the Military Subsistence Supply

Canned: Tuna was the principal canned fishery product purchased for the use of the Armed Forces during January this year.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, January 1961 with Comparisons

Product	QUANTITY			VALUE		
	January	Jan.-Dec.		January	Jan.-Dec.	
	1961	1960	1960	1961	1960	1960
	(1,000 Lbs.)			(\$1,000)		
Tuna	1,002	451	3,610	442	191	1,613
Salmon	-	-	3,593	-	-	2,436
Sardine	21	6	147	11	4	61

Purchases of canned tuna in January 1961 were 122 percent greater than in January a year earlier.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

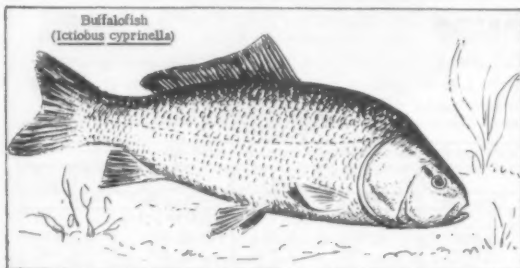


Fish-Farming

PRODUCT-DEVELOPMENT WORK AIDS ARKANSAS FISH FARMERS:

Product-development work involving buffalofish was included among the technological activities of the U. S. Bureau of Commercial Fisheries the latter part of 1960. These fish are being harvested from flooded rice fields and impoundment areas of Arkansas. Large quantities currently are being produced, and the potential possibilities for even greater production are good.

Utilization of this species has been limited, due to the presence of a large number of "floating bones" in the back portion of the fish. Through experimental studies technol-



ogists have discovered that the bone problem is considerably alleviated by scoring of the fillets. The fillet yield is high for small buffalofish (50 to 60 percent) and the general texture, flavor, and appearance is very acceptable.

More recent studies have been conducted to investigate the acceptability of buffalofish in forms other than fresh or frozen fillets. It was found that smoked buffalofish fillets are very acceptable and many of the local producers are now considering the commercial production of this product.



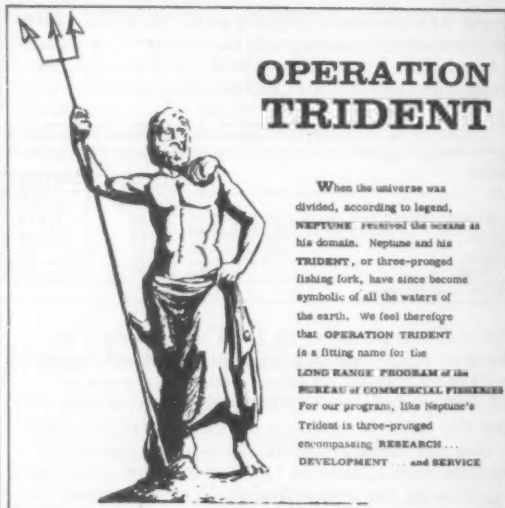
Fish and Wildlife Service

LONG-RANGE REPORTS ISSUED:

Measures for protecting fish and wildlife resources and ways to strengthen and preserve the Nation's vast food-fishery resources, are outlined in two long-range reports issued January 20, 1961, by Secretary of the Interior Fred A. Seaton.

The two reports are: Operation Trident by the Fish and Wildlife's Bureau of Commercial Fisheries, and Conservation in Action, A Pledge for the Future by the Bureau of Sport Fisheries and Wildlife. The reports were previously distributed for comment to the Governors of the 50 States, and to conservationists and conservation organizations. Both reports have been substantially revised since that time. These reports must now be submitted to the U. S. Bureau of the Budget for coordination within the Executive Branch, and final submission to the Congress.

Operation Trident: Named from Neptune and his three-pronged spear--standing for research, development, services--pictures the sea as a vast reservoir of natural resources still relatively untouched. It points out that



although it is only about seven miles from the surface of the water to the deepest part of the sea, we know less about this real world so near than we do about the cold reaches of outer space. It also calls attention to the growing importance of fisheries in world affairs and urges that the United States strengthen its position of leadership in international fisheries. The long-range program of the Bureau of Commercial Fisheries is designed to help narrow this gap in knowledge and thus aid the national economy and the national defense.

The report shows how proper financial planning and adequate financial support can

bring quick results of permanent benefit to the Nation and provide valuable basic knowledge to improve and reduce the costs of harvesting, processing, and marketing of fish.

It cites accomplishments that point the way to the eradication of the sea lamprey in the Great Lakes; rehabilitation of the shad runs on the Atlantic Coast; increased medical research on the use of fish oils recently found to be particularly effective in lowering the cholesterol levels of the blood; increased knowledge of the circulation of the ocean through a recent discovery of a major ocean current in the Pacific; development of air-bubble curtains to guide and capture fish; and discovery of valuable new fishery resources and fishing grounds.

Conservation in Action: A Pledge for the Future details the fish and wildlife areas in which the Federal Government has management responsibilities, and emphasizes the part the Bureau of Sport Fisheries and Wildlife can play in research on the problems which must be solved if the Government, the States, and other land holders are to manage their wildlife resources at optimum levels. It stresses phases of the work which extend beyond state boundaries. The report stresses programs which it says are of such urgency that immediate action is needed. Topping the list is wetlands preservation and saving choice marshes for wildlife while there is still time.

Also cited are: Bringing the National Wildlife Refuges up to maximum capacity; intensive waterfowl production, making two ducks grow where only one grows now; species management of waterfowl; protecting birds in trouble and hunting those in adequate supply; mourning dove management, so this popular game bird in 30 States and a song bird in the others can continue to exist in satisfactory numbers; protection of endangered species; research on pesticides to learn how to protect farm crops without endangering fish and wildlife resources; control of depredations by wildlife to facilitate reforestation and aid agriculture; research on reservoirs to make them real fishing havens; studies on marine sport fisheries to keep pace with their increasing popularity; selective control of fish populations by chemical, mechanical or electrical methods to protect wanted species of fish from the inroads of undesirable species; and an educational program to acquaint the public with problems and progress.

The report emphasizes that most of the hunting and fishing now is, and in the future will be, on private lands and that through research these lands can be made to support wildlife as well as agriculture and forests.

To begin the acquisition of wetlands at a rate fast enough to be worthwhile, the Bureau of Sport Fisheries and Wildlife report proposes that Congress establish a Federal revolving fund of \$150 million dollars, to be repaid by duck stamp revenue. It recommends also that the Government make \$100 million available to the States on a 30-year basis for the purchase of wetlands.



Freezing

FIRST LIQUID NITROGEN FREEZER ADAPTED TO PRODUCTION LINE:

A New York firm has developed a machine which freezes packages of food to temperatures of -320° F. for ultra-quick freezing. The machine, which uses liquid nitrogen for freezing, has been designed to fit into the last phase of a packer's production line. It requires only 128 square feet of floor space and has a capacity of 120 packages per minute. Packages of prepared foods in wire baskets come off the production line at 160° F. to 180° F., and on to a conveyor which conveys them through a gentle shower of liquid nitrogen. After the shower the packages are immersed in a pool of liquid nitrogen at -320° F., the immersion time being regulated to the size, type, and shape of the package. A reliquefier machine is connected to the unit so that nitrogen may be used many times thus reducing the over-all operating costs. The amount of nitrogen loss may range from 5 to 10 percent.

The process can be extended to the trucker who can make use of the firm's new insulation insert designed to utilize liquid nitrogen. It is stated that the process is competitive with the standard methods of refrigeration used in transportation. (*Quick Frozen Foods*, June 1960, pp. 31, 157, and 158.)



Gulf Exploratory Fishery Program

COMPARATIVE STUDIES OF STANDARD AND EXPERIMENTAL TRAWL ASSEMBLIES MADE BY "GEORGE M. BOWERS:"

Cruise 32: The U. S. Bureau of Commercial Fisheries exploratory fishing vessel *George M. Bowers* completed Cruise 32 February 17, 1961. During the first half of the cruise (11/28 - 12/17/60) operations were conducted in the Panama City area and during the second half (1/17 - 2/17/61) in the Eleuthera, Bahamas, region.



The *George M. Bowers* crew engaged in shrimp-trawl-door mechanics investigations.

Instrumentation and methods for measuring directly significant mechanical parameters of shrimp gear were designed and tested. These included a trawl-door angle-of-attack indicator, a door-net leg-angle indicator, a trawl-and-door-spread indicator, and a towing-warp-angle indicator. These instruments and others will be used in future shrimp-trawl mechanics investigations. Preliminary testing indicates the configuration of a given shrimp trawl assembly varies widely dependent upon speed, scope ratio, and flotation. Movies of a 40-foot balloon trawl on 6 by 2½-foot doors at various speeds and scope ratios were obtained.

Four designs of 5-foot model midwater trawls were constructed and comparative towing tests conducted to evaluate the comparative efficiency of each. No attempt has been made to achieve hydrodynamic similarity between the models and full-scale trawls. The sole objective is to compare various 5-foot designs. A model patterned after the British Columbia midwater trawl

was used as a standard and three experimental designs tested against it. The experimental designs included a pyramidal shape and two conical shapes. These trawls were designed as frame works of given dimensions and the webbing hung to fit the frames. This hanging technique is in contrast to the standard method where the trawl is hung to the headrope, footrope, and breastlines and permitted to assume its own position longitudinally. The mesh configuration chosen for these initial experiments was a square (hung in 70.7 percent of stretched measure in both directions) since approximately 15 percent less webbing is required to cover a given area with this shape than with the 50 percent lateral, 86.6 percent longitudinal configuration.

The lateral and vertical deflecting forces were obtained using spreaders at each corner of the trawl. The standard method of doors, floats, and weight or depressors was abandoned because flotation devices large enough to be effective produced drag out of proportion to the total drag of the model assembly. The corner spreaders functioned well, were easy to handle, and permitted sharp turns while towing without fouling the gear. Also, since the resultant force of the spreaders was at a diagonal to both the horizontal and the vertical planes, flotation and depressing devices with their attendant drag and inconvenience were not required.

Observations of the standard and pyramidal nets indicated two significant features: that the body of the trawl tended to assume a conical shape and that the hanging lines (headrope, footrope, and breastlines) tended to tow in a direction parallel to the towing direction rather than at an angle to it as they were designed to do. Consequently, a conical design was constructed with the headrope, footrope, and breastlines cut as hyperbolic sections of the cone (parallel to the direction of tow).

Measurements of the gear indicate the experimental designs tow with less drag than the standard particularly at higher speeds and that the conical design required less force to open than either the standard or pyramidal designs. Also, the magnitude of load in the bag had little effect on the spread over the speed range tested (0.9 to 2.9 knots).

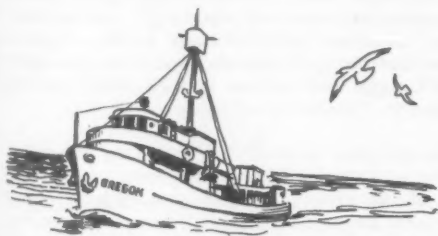
The performance of the standard, pyramidal, and conical nets at various speeds

with various loads in the bag were recorded on 1,000 feet of movie film.

A sea sled to vessel communication system was designed and constructed. The system functioned well permitting accurate longitudinal positioning of the sled and change of water speed and scope ratio without surfacing. The ability to communicate from underwater to the towing vessel increases effectiveness of observation, photography, and measurement from the sled many times. It also offers a greater degree of safety in that the vessel can be signaled immediately in the event of mishap.

EXPERIMENTAL MIDWATER TRAWLS TESTED AND COMPARED WITH BRITISH COLUMBIA-TYPE MIDWATER TRAWL:

M/V "Oregon" Cruise 73: Tests of two experimental midwater trawl designs and the comparative performance of the British-Columbia-type midwater trawl were made by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel during a cruise that ended on February 10, 1961. The work was carried out intermittently (January 11-15, January 26-29, February 1-3, February 8-10) in the 20- to 50-fathom area east of the Mississippi Delta.



On a total of 25 midwater trawling stations, correlations were made between vessel speed, vertical net movement, spread, and warp length, using the electric telemeter and pitometer log. Comparative data on 3 different types of trawl doors was also obtained.

This work only partially completes the tests on the new-type gear. However, there is strong evidence that one of the designs will permit an increase of towing speed of over 100 percent without sacrificing any of the required net spread.

The 50-foot-square nets used during the cruise have been disassembled and are being reconstructed with different tapers and increased size for further testing on cruise 74.



Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, FIRST QUARTER 1961:

Civilians consumed somewhat less fishery products per person in the United States last year than in 1959. Prospects are that the rate for the next few months will continue no higher than a year earlier. Retail prices of these foods in 1960 averaged about the same as in 1959, with the level lower in early 1960 and higher during the remainder of the year as supplies became relatively less plentiful than a year earlier.

The catch of food fish and shellfish in 1960 was slightly higher than in 1959. The increase in landings of species used mainly in the canned form was almost offset by reductions for those marketed as fresh or frozen products. The pack of canned tuna was record large and canned pack increases over 1959 also occurred for mackerel, salmon, and Maine sardines. However, the packs of the last two items each were low in 1959. Imports of fresh and processed fishery products in 1960 were well below those of a year earlier because of reduced supplies in countries which are important exporters.



Supplies of edible fishery products into early spring 1961 are expected to remain somewhat below those of a year earlier. Stocks of the processed items were a little lower at the beginning of this year than last, and the commercial catch of fish and shellfish will remain seasonally low for the next month or so. Imports of fishery products may be no larger than in early 1960. Retail prices of fishery products into early spring

are expected to continue noticeably above a year earlier.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's February 24, 1961, release of the National Food Situation (NFS-95).



Maryland

STUDY CONCLUDES THAT FISHWAY AT CONOWINGO DAM WOULD HAVE LITTLE VALUE:

The construction of a fishway over Conowingo Dam in the lower Susquehanna River might benefit eels and eel-fishermen, but would probably produce no appreciable gains to other important fish (shad, striped bass, catfish, etc.) or their fisheries. These are the principal conclusions of a five-man fishery Advisory Committee which supervised the recently completed three-year Susquehanna Fishery Study.

The chairman of the Advisory Committee and Director, Maryland Department of Research and Education, announced these conclusions on February 21, 1961, with the publication of the 81-page final printed report entitled, The Susquehanna Fishery Study, 1957-60: A Report of a Study on the Desirability and Feasibility of Passing Fish at Conowingo Dam. The report was jointly issued by the Maryland Department and the electric company which operates the dam at Conowingo, Md. It contains the recommendations of the Advisory Committee and the results of intensive research on fish and fishing below and at the Conowingo Dam and in the reservoir up the river to the next dam at Holtwood, Pa. The report is being sent to the members of the Chesapeake Bay and Tributaries Committee of the Maryland House of Delegates and to other pertinent legislators and conservationists.

The study was designed to answer the question, "If fish could pass this dam, would there be increased production of young fish, more adult fish, and better fishing?"

Conowingo Dam is the first of three substantial dams which would be encountered

by fish moving upstream. Others are at Holtwood and Safe Harbor, Pa. Conowingo was completed in 1928, and two fishways were designed for installation. However, on advice of what is now the U. S. Bureau of Commercial Fisheries that they probably would not pass fish, they were never constructed, and the power company pays \$11,000 each year to Maryland and Pennsylvania for use in improving fishing in the river. When Maryland considered legislation to require the installation of fishways in 1955, a legislative committee agreed with the power company that there was insufficient knowledge for fair decision on the problem, and the owners of the dam agreed to provide support for this thorough study.

A wide variety of research tools was brought to bear on the problem. A historical study showed that the average annual value of fish caught commercially in the upper river between 1887 and 1908, before the dams were built, was \$45,000. At present prices, the best catch would be worth about \$85,000 and the minimum worth \$20,000. Field studies included planting 6,729 shad, 4,022 striped bass, 1,123 glut herring, and 166 catfish above the dam, and most of the fish were tagged to trace their movements. Other "control" fish were released below the dam. Nets, seines, and trawls were used for three years to check for spawning success above and below the dam. Shad and striped bass were caught below the dam, but none appeared among the 23,000 eggs and larvae and 19,000 small fish caught in Conowingo Lake.

In addition to studying the fish, the researchers studied the fishermen of this part of the river. Thorough creel census provided detailed data on the annual sports take of about 425,000 fish between Havre de Grace and Holtwood Dam. Catfish are kings in these waters, but there is one migrant from the ocean which appears to survive and grow in the river--the eel. Large numbers of young elvers, which hatch only in the ocean, annually reach Conowingo. Pennsylvania fishermen feel that fresh-water eels are far superior to those that remain in brackish water and would like to have more available.

For the other fish, intensive study yielded no evidence that they would successfully spawn in the reservoir or that they would establish a new fishery above the dam. No eggs or larvae were found, except for a

single herring fry, and very few of the planted fish were caught in the reservoir while rather large numbers were successful in going back down the river through or over the dam.

Simultaneous physical and chemical studies of Conowingo Lake by the Chesapeake Bay Institute showed that there is little quiet water present during the normal high spring flows that occur during spawning season; that water moves through the reservoir in about 24 hours; that shad and striped bass eggs would probably be carried out of the lake before they hatch; that most of the water deeper than 40 feet contains too little oxygen during the summer to support fish; and that the Lake drops a heavy silt load unfavorable to any eggs which reach the bottom.

The report also contains detailed statements on the movements of fish, the kinds of young and larval fish present in the upper Chesapeake area, and many other data which add substantially to present knowledge of fish and fishing.

The Chairman of the Advisory Committee commented on the geographic scope of the study: "Most of this research was limited to the Conowingo region and to the effects of passing fish only at that dam. The Committee feels that the study provides a strong basis for reasonable decisions in that region. The findings may also apply to the next dam at Holtwood and to its reservoir. Above that reservoir, river conditions are somewhat different."



Massachusetts

FROZEN FOOD CODE EFFECTIVE IN FEBRUARY:

The Massachusetts version of the model code for the frozen food industry as developed by the Association of Food and Drug Officials of the United States (AFDOUS) went into effect on February 1, 1961.

According to the director of the Department of Public Health's State Division of Food and Drugs, "There is 80 percent compliance already with the provisions of the State code." The remaining 20 percent, he explained, is not opposed to the State code, but is having difficulty in getting delivery of new equipment to comply with it.

Originally, the State code was to go into effect August 1, 1960, but the effective date was postponed.

The main objective in the Massachusetts code is to maintain frozen foods (including fishery products) at 0° F. from processor to consumer. Under the State code a warehouse can accept frozen food that is up to 10° F. if the air temperature in the warehouse does not go above 0° F. If, however, the temperature of the frozen food is above 10° F., the warehouse can accept it, but the frozen food may not be removed from the warehouse until the owner of the frozen food notifies the Public Health Department.

The Massachusetts version of the AFDOUS code differs from the model code in several major areas. One of the differences is that in the Massachusetts code, "thawed-out" commodities, such as chicken, turkey, and fish do not have to be maintained at 0° F. from start to finish, as in the model code. These "short-term" frozen foods, which must be frozen at 0° F. in the warehouse, can be kept at the regular 40° F. temperature in the display case or by restaurants and other institutional outfits for use during holidays and meatless days. The AFDOUS code does not differentiate between regular frozen food and "thawed-out" commodities. (*Food Field Reporter*, January 30, 1961.)



Michigan

COMMERCIAL FISH LANDINGS INCREASE SLIGHTLY IN 1960:

As in other Great Lakes states, the plight of the commercial fishing industry is serious in Michigan. This is shown in part by Michigan's roster of licensed commercial fishermen which last year dropped to 997, barely above the all-time low of 1957.

The commercial fishermen landed slightly more than 23 million pounds of fish from the Great Lakes in 1960, an increase of about 750,000 pounds from 1959. Although the commercial fish catch was up somewhat in 1960, quality was down, a trend which started several years ago.

Lake trout production was below 300,000 pounds. This is less than half of the 1959

yield and 5 percent of the lake trout poundage for 1941, best of the last 20 years. Whitefish landings rose about 130,000 pounds in 1960, but were 93 percent below the record year for whitefish.

Pickering and herring landings were down considerably while catches of chubs and perch

apparently reached a new high. Introduction of trawling in southern Lake Michigan yielded about 1.5 million pounds of fish; all

but 125,000 pounds went for industrial uses, mostly animal food.

Value of the 1960 landings is estimated at \$2,750,000. In 1948, one of the State's banner years, commercial fishermen took over 30 million pounds, valued at \$5 million.



North Atlantic Fisheries Exploration and Gear Research

SURVEY OF MIDWATER FISH STOCKS INITIATED:

M/V "Delaware" Cruise 61-1: The first in a series of cruises devoted to studying the waters of the Northwestern Atlantic for concentrations of midwater resources was completed by the U. S. Bureau of Commercial Fisheries research vessel Delaware on February 2, 1961. Operations extended over an 11-day period.



M/V Delaware Cruise 61-1 (Jan. 23-Feb. 2, 1961).

Sonic equipment capable of scanning a zone up to 2,000 yards ahead and/or to either side of the vessel was employed in conjunction with a sensitive depth-recording indicator. The principal area of operations was along the "edge" of the Continental Shelf between the Nantucket Lightship and the Hudson Canyon; depths worked included those between the 40- and 125-fathom contours.

In addition to surveying the area with electronic fish-finding equipment, some fishing was completed with both bottom and "mid-water" trawls.

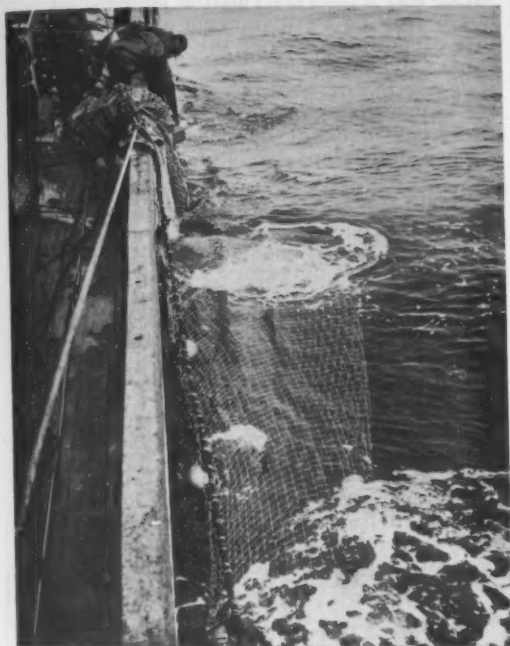
A standard No. 41 otter trawl was employed to determine the composition of species present on the bottom. Over 15 commercially-important species were recorded from 10 locations. Included, and of particular interest, were captures of Boston mackerel (*Scomber scombrus*), American shad (*Alosa sapidissima*), and haddock (*Melanogrammus aeglefinus*).

At eight locations, experimental midwater trawls were fished--catches with this gear were not in commercial quantities. However, the following species were represented by small catches: hake (*Merluccius* sp.); butterfish (*Poronotus triacanthus*); scup (*Stenotomus chrysops*); spiny dogfish (*Squalus acanthias*); and Boston mackerel (*Scomber scombrus*).

Bathythermograph and other hydrographic data were taken. Surface drift bottles were released, in cooperation with the Woods Hole Oceanographic Institution, at approximately 10-mile intervals along the vessel's track.

STANDARD MANILA OTTER TRAWL COMPARED WITH EXPERIMENTAL TRAWL CONTAINING POLYPROPYLENE PARTS:

M/V "Delaware" Cruise 61-2: Comparison tows were conducted by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware February 7-15, 1961, using two No. 41 otter trawls, one a standard net constructed of manila twine and the other a similar net constructed to No. 41 dimensions but with the top wings, top belly, square, and some ropes made of polypropylene (similar to polyethylene) twine. The purpose of this cruise was to determine whether or not a trawl constructed partially of this synthetic fiber material would result in increased fishing efficiency.



Otter trawl with polypropylene sections. Note floating twine.

A total of 86 1-hour tows was made on the southeast part of Georges Bank and on Tobins Bank. An odometer was attached to the cod-end of each trawl to determine the over-the-ground distance covered by the trawls.

Length measurements were taken of all individuals of commercial species of fish caught to determine the quantity and composition of the catch and to obtain data for determination of fish escapement through 5-inch polypropylene netting as compared to 5-inch manila netting. Internal, wet, after-use measurements were taken on the top sections of both trawls.

Examination of the trawl data indicated (1) a slight increase in the distance covered by the trawl containing polypropylene material and (2) a somewhat higher catch-rate for the experimental net. The polypropylene quarter ropes and bullrope used with it were found to ease the handling of the net due to their pliability and their light weight which allows them to float on the water. (Polypropylene ropes and twine are stronger for comparable size, yet lighter than manila and do not lose strength when wet.) After-use

measurement of the meshes found the manila netting to average 4.47 inches as compared to 5.05 inches for the polypropylene.

Net sections similar to those tested have been supplied three commercial fishing vessel captains for trial use. A captain who has used a polypropylene belly section for two trips reports that he believes the altered net fishes better. No report has been received to date from the others. Further testing of the synthetic netting is planned to more closely define its merits as compared to standard manila twines. Additional reports will be circulated reporting future testing aboard the M/V Delaware and commercial fishing vessels.

Bathythermograph data was taken and drift bottles were released in cooperation with the Woods Hole Oceanographic Institution.



North Atlantic Fisheries Investigations

BIDS REQUESTED FOR NEW FISHERY RESEARCH VESSEL:

The U. S. Bureau of Commercial Fisheries has asked for bids to construct a new research vessel to replace the Albatross III which was deactivated in February 1959.

The Bureau has invited shipyards to bid on the construction of a welded steel vessel as designed by a Boston, Mass., naval architect. The design includes dimensions of 187 feet over-all, 33-foot beam, 1,000 tons displacement, a speed of 12 knots, and a range of 9,000 miles.

The new research vessel will make possible urgently needed investigations of the factors that affect the distribution and abundance of commercially-important species in the Northwest Atlantic.



North Pacific Exploratory Fishery Program

SINGLE-VESSEL
PELAGIC TRAWL IS OBJECTIVE
OF M/V "JOHN N. COBB" RESEARCH:
Cruise 49: The U. S. Bureau of Commercial Fisheries exploratory fishing

vessel John N. Cobb departed on February 13, 1961, for 8 weeks of gear development work in cooperation with the Washington Department of Fisheries and the Bureau's Pacific Salmon Investigations. Members of the research staffs of the cooperating agencies were aboard during a part of the cruise. Master divers from the U. S. Naval Torpedo Station at Keyport, Wash., also were aboard to assist in underwater observation of surface and midwater trawl gear. The vessel was due to return from the area of operations (San Juan Islands, Georgia Straits, and off Cape Flattery) on April 7, 1961.

The primary purpose of the cruise was the development of a large, single-boat pelagic trawl which can be used on the surface or in midwater. Secondary objectives of the cruise include:

- 1.- Testing of newly-designed hydrofoil doors to determine their effectiveness in opening a large, small-mesh herring midwater trawl.
- 2.- Testing and use of 1-inch spherical omni-directional acoustic transducers to measure trawl performance variables.
- 3.- Testing the performance of a new type electrical trawl cable.
- 4.- Determination of the relationship of net opening to the amount of "hang-in" of meshes attached to rib lines.

A recently-constructed "surface trawl" was observed by divers to determine needed modifications. Data on trawl performance was obtained by electronic indicators, diver observation, and comparative fishing tests.



Oceanography

SCRIPPS INSTITUTION OF OCEANOGRAPHY INVESTIGATIONS IN SOUTHEAST PACIFIC:

The vessel Horizon of the University of California's Scripps Institution of Oceanography returned to San Diego at the end of December 1960 from a three-months expedition off Peru and northern Chile. Aims of the expedition were to determine whether an east-flowing surface current south of the Equator actually existed, as predicted by theory and previous sparse data; whether

there was a current running beneath the north-flowing Peru Current and in the opposite direction; whether the north-flowing Peru Current arises in the Antarctic or farther north; and what happens to the water in the narrow, swift Cromwell Current, which flows east beneath the Equator, after it passes the Galapagos Islands.

South Equatorial Countercurrent: Several months ago Joseph L. Reid, Jr., Scripps Institution of Oceanography, published a paper predicting that between 5 and 10 degrees south of the Equator there would be found an eastward-flowing current that is the mirror image of the North Equatorial Countercurrent. The expedition charted this current. It is a flow about 300 miles wide, not as strong as that in the north, but powerful enough to drive the ship well to the east of her course.

Undercurrent off Peru: The cool, rich, northward-flowing waters of the Peru Current were found to be underlain by another current at depth running south. The existence of this current had also been predicted.

Source of Peru Current: During most of the year, the west coast of South America is bathed by cool, north-flowing currents. It has been assumed that these form a single current several thousand miles long. The expedition found that there are two current systems, one off Chile, one off Peru. Between the two in northern Chile there is a patch of relatively warm water which is the site of rich tuna catches. The Chilean Current turns westward to sea, and the Peru Current comes into being well north of the turn.

Cromwell Current: Efforts to trace the Cromwell Current east of the Galapagos Islands were not successful. (Pacific Science Association Information Bulletin, January 1961.)



Oregon

BIDS INVITED ON NEW TYPE FISHWAY:

Something different in the way of fish passage structures is being planned by the Oregon Fish Commission for Lookingglass Creek, a tributary of the Grande Ronde River in Union County.

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Lookingglass Falls, a cascade-type flow rather than a sheer drop, is the scene of fish passage difficulties. During favorable high-water conditions steelhead and salmon are able to negotiate the falls. Frequently, however, water conditions are such that anadromous fish are barred from several miles of prime upstream spawning area.

The new fishway, known as the Denil (De-neel) type, will feature baffles so arranged that water currents will flush leaves, twigs, and other debris through without allowing them to accumulate. This will greatly reduce the amount of maintenance necessary to keep the facility at peak operating efficiency. This feature makes the Denil-type structure most suitable for isolated locales where it is not practical to have an attendant present at all times. The Lookingglass structure will be the second of its type in Oregon. The first is being constructed at the outlet of Suttle Lake by the U. S. Forest Service on the recommendation of the Fish Commission.

Steeper than most fish "ladders," the structure has a 1 on 6 slope, meaning that there is a 1-foot rise in elevation for each 6 feet of length. Turbulent water flow is a major factor in the self-cleaning feature. Fish are able to negotiate the current with ease, even with flows up to 30 cubic feet per second.

The fishway will be built of reinforced concrete and measure 6 feet deep, from 4 to 6 feet in width, and 60 feet long.



Oysters

ALABAMA OPENS NEW AREAS FOR OYSTER FARMING:

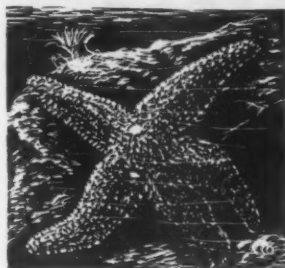
To encourage more oyster production, Alabama Seafood Division authorities stated early in 1961 that all waters of Mobile Bay in Baldwin County south of Point Clear, except areas reserved for State oyster reefs and seed beds, have been opened for leasing. These are barren grounds, some of which are suitable for oyster culture, but are not now producing.



Alabama had an excellent production year in 1959/60, but the supply has been somewhat lower this year according to local sources, probably from losses from the hurricanes which hit there the fall of 1960.

LONG ISLAND SOUND GROWERS PLAGUED BY STARFISH ABUNDANCE:

Starfish were 85 percent more abundant in Long Island Sound in the fall of 1960 than



Starfish

they were in the fall of 1959, according to a survey of the Connecticut Shellfish Commission. The great bulk of the starfish collected were from 2-5 inches in diameter. The great increase in the number of starfish was probably due to two

factors: (1) while the intensity of the set was not too heavy, a high percentage of the set survived and grew. This survival may have been partly the result of a heavy set of the coot clam which is an important food item of the starfish; (2) the increase probably was due to the movement of masses of starfish from deeper waters where oysters are grown.

No matter what the causes, Long Island growers are still beset with this plague which has been so destructive to their seed stock since 1955. Concentrated efforts are being made to fight these infestations using mops and dredges.

PRODUCTION IN TEXAS EXPECTED TO DROP DUE TO FLOODS:

After a bumper production year in 1959/60, Texas officials are fearful that there will be a substantial drop in oyster production during the 1960/61 season. Due to the heavy rainfall and frequent flooding along several major Texas rivers many oysters have undoubtedly been killed.

The San Antonio Espiritu Santo Bay area has been especially hard hit. Flood waters into San Antonio Bay made the Bay so fresh

that many oysters were bloated and killed. This area produced over 600,000 pounds of oyster meats last year, or almost one-half the entire Texas production.



Shucking oysters.

The great majority of Texas oysters are shucked locally and sold within the State. However, some shell stock is taken by Louisiana fishermen and processed in that State.



Puerto Rico

SMALL FISHING CRAFT MOTORIZATION CONTINUES:

Puerto Rico's Department of Agriculture and Commerce early in 1961 reported "The Commonwealth's program for small fishing craft mechanization has been functioning so successfully, that the administration contemplates seeing the Island's entire fleet fully mechanized by 1965."

The Director of the Fish and Wildlife Section of the Commonwealth's Department of Agriculture said, "Puerto Rican fishery reserves can still be further developed. One of the first steps in attaining a significant increase in production is to continue to expand our small craft mechanization program, thereby assisting fishermen. By so doing, they will be permitted to devote more time to fish, extending their radius of operation into new, more productive banks, presently out of reach of oar and sail."

Puerto Rico's annual fishing production is estimated to be in the area of 6 million pounds, with a wholesale value of more than \$1 million. This fresh fish comes from adjacent Puerto Rican waters, and is harvested by a fleet of 1,091 boats, of which 365, or 33 percent are now motorized. Prior to the creation of Puerto Rico's Fisheries Loan Program (under which fishermen can borrow money to finance outboard motor purchases), there were only 913 licensed fishing craft. Of this amount, 210, or only 23 percent were motorized.

During the fiscal year 1958/1959, fishermen purchased 21 motors under the terms of the Fisheries Loan Program. During the 1959/1960 period, they acquired 116 additional units, bringing the combined total to 137 motors. The total value of these motors was \$37,714, of which \$33,738 was lent by the Government, while the fishermen supplied the balance as down payment.

A study was conducted by Puerto Rican authorities in order to evaluate the effects of mechanization with the following results:

1. - The average fisherman's weekly catch increased from 134 pounds prior to motorization, to 201 pounds thereafter, an increase of 67 pounds, or approximately 50 percent.
2. - Annual fish production increased 1.75 tons per fisherman after motorization.

Puerto Rico's Fisheries Loan Program was recently extended to include other phases of the fishing industry. These include the expansion and improvement of an already existent boat yard, and furnishing inland transportation facilities for fish wholesalers. Also, supplies and other related materials are sold to fishermen at cost price, at special stores established for this purpose.

The Puerto Rican Government's program for motorizing small fishing craft is an outstanding example of the benefits derived through modernization. These include: providing more vitally required protein in the form of fish food and economic improvements in fishing regions. The program also helps Puerto Rico to achieve its ultimate goal, developing a surplus for export. (Commercial Outboarder, Spring 1961.)



Salmon

COLUMBIA RIVER FISHING REGULATIONS FOR 1961:

Regulations for salmon fishing in the Columbia River in 1961 were adopted on January 18, 1961, at an all-day public meeting in Longview, Wash. The meeting was a joint one, with both the Washington State Department of Fisheries and the Oregon Fish Commission represented. It was the first official joint meeting held by the two conservation agencies in Washington for 44 years. Both commercial and sports fishing groups were represented at the meeting.

Basic regulations for 1961 are virtually the same as for 1960, with a total of 98 and one-quarter days of commercial fishing allowed. The spring season opened February 15 at noon and the fall season will close at noon October 31. As in 1960, the entire river and all tributaries will be closed to all fishing during November.

A breakdown of the 1961 season shows the regular commercial season open 14 days in February, 23 in April-May, 24 in June-July, 21 in July-August, and 16 in September-October.

These regulations are always subject to emergency changes. As in the past, careful consideration will be given the actual day-to-day status of the runs. Should conditions warrant, emergency hearings may be called and indicated changes made in the regulations.

The research staffs of both Oregon and Washington fisheries agencies presented information on the status of runs in the Columbia. They stressed that fall runs have fallen alarmingly and that emergency regulations may be necessary to curtail catches according to the number of salmon returning to the river in the fall. Concern was expressed over the increasing harvest of fall chinook and silver salmon and the staffs of both States went on record as favoring further discussion to determine the possibility of a complete closure of all fishing during certain critical periods. Evidence was also presented that an increasing sport fishery harvest in the Columbia River system is significantly reducing escapement of spring and summer chinook and summer steelhead.



Sharks

RESEARCH PANEL ESTABLISHED:

A Shark Research Panel was established by the American Institute of Biological Sciences at the request of the Office of Naval Research. The panel is headed by Dr. Perry W. Gilbert of Cornell University. The primary responsibilities of the Panel are to maintain a continuing review of all research activities conducted throughout the world which are pertinent to the shark-control problem.

The Panel has undertaken to compile a comprehensive list of all known cases of shark attack and authenticate these cases whenever possible by means of a questionnaire. This information is being summarized in a forthcoming book to be published by the Shark Research Panel.



Among the shark-research projects receiving support from the Office of Naval Research is one at the University of Hawaii which is seeking to determine the behavior and sensory responses of Pacific oceanic species of sharks to various chemical and physiological agents. In addition to research being conducted at the principal laboratory on Oahu, experimental shark pens have been constructed on Eniwetok in order to permit field experimentation and observations on Pacific species. (Pacific Science Association Information Bulletin, November 1960.)



South Atlantic Exploratory

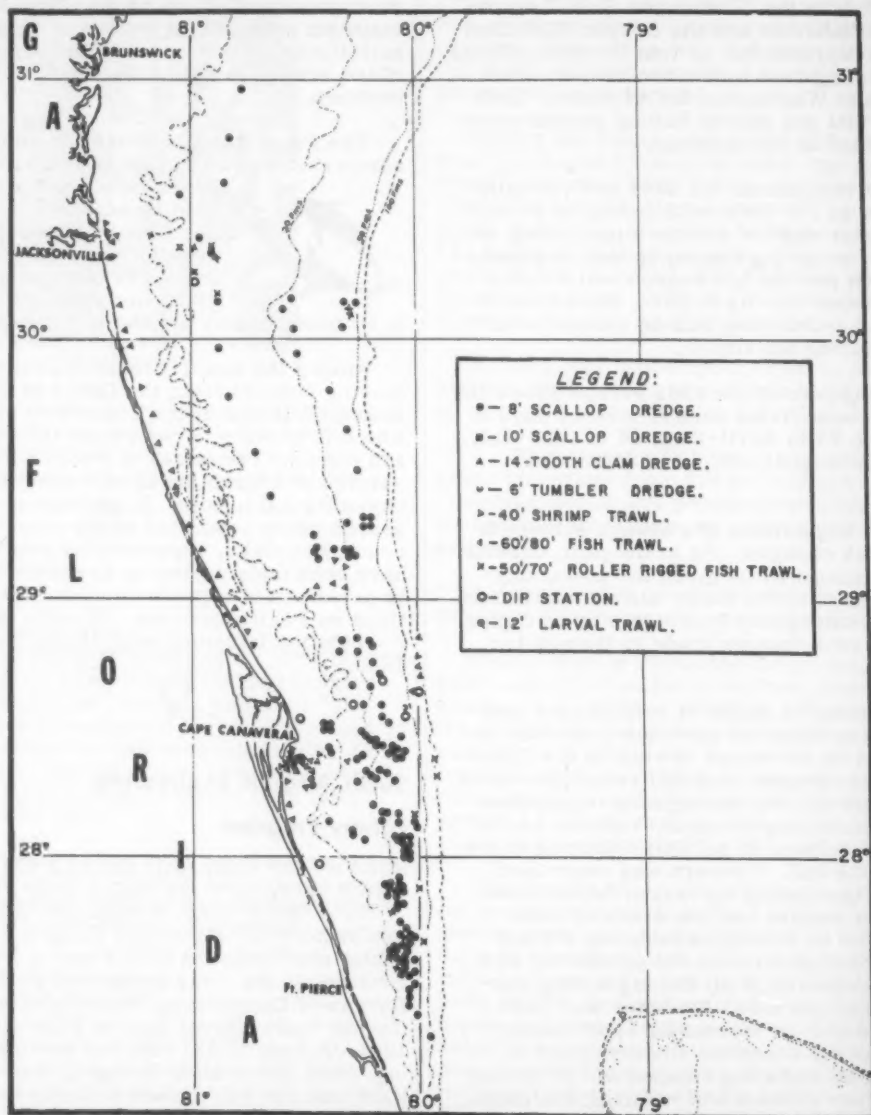
Fishery Program

SURVEY OF FISH AND SHELLFISH RESOURCES OFF GEORGIA AND FLORIDA:

M/V "Silver Bay" Cruise 28: A 26-day exploratory fishing cruise along the continental shelf between Fort Pierce, Fla., and Brunswick, Ga., was completed by the U.S. Bureau of Commercial Fisheries chartered fishing vessel *Silver Bay* on February 10, 1961. A total of 221 fish and shrimp trawling, clam and scallop dredging, and night-light stations were made to further assess the fish and shellfish potential of the area.

Modified Georges Bank-type scallop dredges (8 and 10 foot) were fished in depths ranging from 12 to 65 fathoms, between Fort Pierce and Brunswick. Catches ranged up to 19 bushels of live scallops per 45-minute tow in 18 fathoms off Fort Pierce with a meat yield of $4\frac{1}{2}$ pints per 75-pound bushel. Large

quantities of fresh, dead shell were taken at most dredging stations and small, probably young-of-the-year scallops were caught at the rate of 4 to 6 bushels per half hour tow north of Bethel Shoal. Thirteen observers participated in a one-day demonstration cruise out of Fort Pierce.



M/V Silver Bay Cruise 28 (Jan. 18, -Feb. 10, 1961).

Dredging for hard clams (*Venus* sp.) with a 14-tooth Fall River Clam Dredge was conducted between Eau Gallie and Jacksonville Beach. Generally negative results were obtained in the area surveyed. However, individual clams were taken in Cape Canaveral Cove and 300 dead shells were caught off Matanzas.

Fish and shrimp trawling was conducted between Fort Pierce and Brunswick. One 90-minute drag in 9 fathoms off Cocoa Beach produced, 2,500 pounds of mixed fish, of which 2,000 pounds were butterflyfish (*Poronotus tricanthus*). Off Vero Beach, 558 pounds of mixed fish, jewfish (*Mycteroperca*), and sea bass (*Centropristes striatus*) predominating, were taken in 50 fathoms. Shrimp trawling in the 80- to 100-fathom depth range off Cape Canaveral produced uniformly negative results.



Sport Fishing and Hunting

ECONOMIC SURVEY FOR 1960:

Interviewing on the second national survey of sport fishing and hunting began during the latter part of January 1961. The period covered in the survey will be calendar year 1960.

The interviewing phase of the task continued for about three weeks. Complete results will be available early in autumn, probably in September. The work was done by the U. S. Bureau of the Census under an agreement with the U. S. Bureau of Sport Fisheries and Wildlife, Fish and Wildlife Service.

This survey was undertaken, as was the one for 1955, at the request of the International Association of Game, Fish and Conservation Commissioners.

It will be financed by the Bureau of Sport Fisheries and Wildlife, using funds collected under the Federal Aid in Fish and Wildlife Restoration Acts. These funds are derived from an excise tax on hunting and fishing equipment, such as shotguns and fishing rods. These funds are distributed to the various states under a formula, based upon law, for use on a matching basis by the states in the restoration of fish and wildlife.

The cost of the survey will be within the portion of these funds specified by law as available for use by the Fish and Wildlife

Service in the administration of the program. This means that the cost of the survey will not be charged to general taxes but to the special levy which sportsmen pay through the purchase of the specified sporting equipment.

About 8,000 persons were interviewed. The Bureau of the Census identified these sportsmen in December by screening the sample used in their monthly survey of the United States population. In addition to the customary information gathered in these periodic surveys, the Census Bureau identified the households in which there were one or more individuals 12 years old and older who had hunted or fished in 1960.

The 1955 survey showed that approximately 25 million Americans 12 years old or older had hunted or fished that year. There is reason to believe that there will be a substantial increase in 1960 due to such factors as improved conservation measures of state and Federal agencies, increased opportunities to hunt and fish, increased population, and increased incomes.

The data to be collected regarding the income and occupations of those who hunt and fish should show whether the participants are distributed throughout all occupations or whether there is a predominance of outdoor workers, office workers, or other groups.

Because of the growing importance of marine sport fishing, the 1960 survey will include a comprehensive study of this phase of angling--the first time such a complete study has been made in the United States. Catches of marine game fish by species, area in which they were taken, numbers, weights, and methods used in angling will be determined.

There are about 90,000 miles of tidal shoreline for the 50 states and islands. There are about 220 species of game fish involved, many of which are taken by hook-and-line for recreation.

Data will be gathered on the number of persons who fish in the surf, in the bays and sounds, in the tidal rivers, and in the deep sea. For fresh-water fishermen, data will show the number who fish in man-made ponds, in reservoirs, in natural lakes and ponds, and in the rivers and streams.



Hunters will be classified as to whether they hunted doves, waterfowl, other small game, or big game.



Tuna

WATER TEMPERATURES CORRELATED WITH ALBACORE ABUNDANCE:

Using ship injection temperatures, scientists of the U. S. Bureau of Commercial Fisheries Biological Laboratory at San Diego, Calif., have developed a 12-year sea temperature average (1947-1958) for the north-eastern Pacific Ocean (20° N.-54° N.; 110° W.-150° W.). Charts for the anomalies from the 12-year period are under construction.

The purpose of these charts is to assist in the studies of the availability of albacore



tuna with respect to variations in sea temperatures. Using these charts, it was found that in 1953, 1954, and 1955, the failure of the albacore fishery off the Washington-Oregon coast was contemporaneous with cold sea temperature anomalies of considerable magnitude.



United States Consumption of Fishery Products, 1960

The preliminary estimate of the United States per capita consumption of fishery products in 1960 is 10.5 pounds edible weight, slightly less than the 10.7 pounds reported for 1959. The per capita consumption has remained fairly stable for the past 20 years with only slight fluctuations.



Table 1 - Apparent Civilian Per Capita Consumption of Fish and Shellfish in Edible Weight, 1935-39 and 1947-49; Annual Averages, 1958-60.

Commodity	1960 ¹	1959	1958	Average 1947-49	Average 1935-39
			(Pounds)		
Fresh and frozen	5.9	5.9	5.9	6.0	5.4
Canned ²	4.0	4.2	4.2	3.9	4.9
Cured	0.6	0.6	0.6	0.6	0.7
Total	10.5	10.7	10.7	10.5	11.0

¹/Preliminary.

²/Excludes products containing small quantities of fish or shellfish, such as clam chowder, etc.

tuations. But because the total population in that period has increased substantially, the total amount of fishery products consumed in the United States has increased steadily each year.



United States Fisheries

AVERAGE PRODUCTION YEAR IN 1960 ESTABLISHES NEW RECORDS FOR SEVERAL CATEGORIES:

In terms of total catch and value the Nation's commercial fishery activity for 1960 could be called average, but a review of the available data shows that five production records were broken, four new import marks were established, and the catch of one species hit a hundred-year low.

The total catch for 1960 was 4,850,000,000 pounds--270 million pounds below the catch of 1959; the value at boatside was estimated at \$347 million, or one million dollars more than in 1959. In eight previous years the value has exceeded that figure.



Salmon, clam, and crab-meat cannery in Cordova, Alaska.

The amounts received by fishermen and vessel owners for California tuna, Gulf of Mexico and South Atlantic shrimp, and Alaska salmon increased sharply. The income from the New England groundfish harvest and from the Gulf and Atlantic menhaden fishery declined sharply, primarily because of lower prices. The Washington salmon fishermen and vessel owners also had reduced income because of the decline in the catch.

San Pedro, Calif., was the leading United States fishing port in both quantity (360 million pounds) and ex-vessel value (\$40 million). Lewes, Del., was second on the basis of quantity only, 281 million pounds; then Pascagoula, Miss., 213 million; Gloucester, Mass., 194 million pounds. New Bedford, Mass., with good scallop landings was second in value with \$13 million; followed by Boston, Mass., \$9.4 million, and Gloucester, Mass., \$6.4 million.

Production records were established on:

Canned tuna, with a record pack of 15.3 million cases as compared with the previous record of 14.3 million cases in 1959.

Sea scallops, with record landings of 26.5 million pounds of meats as compared with the previous high of 24.6 million pounds taken in 1959.

Gulf menhaden, with record landings of 831 million pounds, about 79 million pounds above the previous mark set in 1959. (Other menhaden fisheries showed declines.)

Menhaden oil production of almost 23.7 million gallons as compared with the previous high of 22.4 million gallons in 1956.

The Bristol Bay salmon run established a near record, yielding a United States catch of 15 million fish.

The oyster take of 59 million pounds of meats hit practically an all-time low. It has been well over 100 years since the annual oyster harvest has been that small. The 1960 harvest was less than 40 percent of that taken in 1880.

There were in 1960 record imports for shrimp, 113.4 million pounds; fresh and frozen spiny lobsters, 32.3 million pounds; canned oysters, 7 million pounds; fresh and frozen sea scallops, 6.9 million pounds. Imports of groundfish fillets and blocks were less than in 1959 but higher than in any other year prior to 1959.

The South Atlantic and Gulf shrimp catch was 236 million pounds, or 8 percent above the 1959 catch, but the harvest on the Pacific coast was 12.6 million pounds or 39 percent below the previous year. The total catch of groundfish (cod, cusk, haddock, hake, pollock and ocean perch) was 337 million pounds, or 4 million pounds less



Shrimp trawlers at a dock in a Mississippi port.

than in 1959. The catch of Pacific and jack mackerel was up; the total catch of menhaden was almost 2.0 billion pounds, 209 million pounds below 1959; the pack of Maine sardines was 1,975,000 cases, up 222,000 cases from the previous year; and the pack of California sardines was 636,000 cases, or 119,000 cases less than in 1959.



United States Fishing Fleet¹/Additions

JANUARY 1961:

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, January 1961

Area	January		Total 1960
	1961	1960	
	(Number)		
New England	3	1	34
Middle Atlantic	-	1	13
Chesapeake	3	5	76
South Atlantic	1	3	45
Gulf	11	4	85
Pacific	5	2	138
Great Lakes	-	-	17
Total	23	16	408

Note: Vessels assigned to the various areas on the basis of their home ports.

A total of 23 vessels of 5 net tons and over were issued first documents as fishing craft during January 1961--7 above the same month of 1960. The Gulf Area led with 11 vessels, followed by the Pacific with 5, New England

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, January 1960

Net Tons	Number
5 to 9	12
10 to 19	4
20 to 29	3
30 to 39	1
40 to 49	1
50 to 59	1
250 to 259	1
Total	23

¹/Includes both commercial and sport fishing craft.

and the Chesapeake each with 3, and the South Atlantic area with 1.



U. S. Foreign Trade

SHRIMP IMPORTS, 1959-60:

United States imports of all shrimp (fresh, frozen, canned, and dried) from all countries in 1960 amounted to 113.4 million pounds as compared with 106.6 million pounds imported in 1959, an increase of 8.4 percent.

Shrimp imports from Mexico in 1960 totaled 73.5 million pounds, up about 7.2 percent from the 68.7 million pounds imported in 1959.

Some sharp increases and decreases in the United States imports of shrimp occurred from 1959 to 1960. Imports of shrimp from El Salvador increased 264.5 percent or from 1,838,000 pounds in 1959 to 6,699,000 pounds in 1960. On the other hand, shrimp imports from Japan in 1960 of 2,949,000 pounds were down by 59.2 percent from the 7,229,000 pounds imported in 1959. Imports of shrimp from British Guiana of 3,568,000 pounds in 1960 were up 269.0 percent from the 967,000 pounds imported in 1959. Iran increased its exports of shrimp to the United States by 65.7 percent in 1960 as compared with 1959, or from 740,000 pounds to 1,226,000 pounds; and Pakistan's 1960 exports jumped 59.0 percent or from 640,000 pounds to 1,018,000 pounds. Shrimp imports declined 4.3 percent from Panama, 11.0 percent from Ecuador, and 62.0 percent from Costa Rica. During 1960 shrimp were imported into the United States from 46 countries as compared with 49 countries in 1959. (See table in next column.)

Note: Most imported shrimp is frozen, except for some canned shrimp from northern Europe, Japan, and India; small quantities of dried shrimp from Japan and Hong Kong; and a small quantity of fresh shrimp from Mexico.

EDIBLE FISHERY PRODUCTS, DECEMBER 1960:

Imports of edible fresh, frozen and processed fish and shellfish into the United States during December 1960 decreased by 11.3 percent in quantity and 6.1 percent in value as compared with November 1960. The decrease was due primarily to lower imports of groundfish and other fillets (down 4.3 million pounds),

United States Shrimp Imports (Fresh, Frozen, Canned, and Dried), 1959-60		
Country of Origin	1960	1959
.. (1,000 Lbs.) ..		
Mexico by Customs Districts:		
Massachusetts	52	-
Florida	553	490
Charleston, S. C.	23	-
New Orleans	3,890	3,270
New York	92	-
Laredo	19,274	21,631
Galveston	140	-
El Paso	27	110
San Diego	1,599	1,444
Arizona	47,673	41,674
Los Angeles	227	34
Washington	4	-
Michigan	5	-
St. Lawrence	-	1
Oregon	25	-
Total Mexico	73,584	68,654
British Honduras	1	83
Greenland	26	-
Canada	332	134
El Salvador	6,699	1,838
Guatemala	259	182
Honduras	362	271
Nicaragua	266	213
Costa Rica	460	1,156
Panama	8,423	8,805
Canal Zone	-	64
Trinidad	194	-
Bahamas	79	-
Cuba	80	229
Leeward & Windward Islands	-	13
Netherlands Antilles	-	46
Jamaica	-	48
Colombia	2,173	1,899
Venezuela	344	370
British Guiana	3,568	967
Surinam	381	288
Ecuador	4,193	4,712
Peru	256	279
Chile	738	327
Brazil	46	79
Argentina	61	946
Iceland	92	32
Sweden	2	13
Norway	110	160
Denmark	80	196
United Kingdom	-	62
Netherlands	1	2
West Germany	2	82
Finland	-	1
Spain	225	192
Italy	-	185
Lebanon	-	5
Turkey	-	2
Iran	1,226	740
Israel	2	43
Kuwait	147	-
Saudi Arabia	77	-
India	2,892	2,866
Pakistan	1,018	640
Singapore	-	1
Indonesia	7	-
Philippines	24	1
Vietnam	97	1
Thailand	40	52
Korea	76	198
Hong Kong	2	640
Taiwan	3	15
Japan	2,949	7,229
Australia	128	284
New Zealand	26	-
Egypt	1,668	1,310
Grand Total	113,419	106,555

and frozen albacore and other tuna (down 1.7 million pounds), and to a lesser degree, a decrease in the imports of frozen shrimp and canned and fresh and frozen salmon. The decrease was partly offset by a 2.0-million-pound increase in the imports of lobster and spiny lobster.

Compared with December 1959, the imports in December 1960 were down by 20.3 percent in quantity and 12.1 percent in value due to lower imports of frozen albacore and other tuna (down 6.8 million pounds), and groundfish and other fillets (down 7.8 million pounds). Compensating, in part, for the decrease was an increase of about 1.8 million pounds in the imports of shrimp (up 1.8 million pounds) and an increase of 0.6 million pounds in the imports of canned tuna in brine.

U. S. Imports and Exports of Edible Fishery Products, December 1960 with Comparisons						
Item	Quantity		Value			
	December 1960	Year 1959	December 1960	Year 1959	December 1960	Year 1959
	(Millions of Lbs.)		(Millions of \$)			
Imports:						
Fish & shellfish: Fresh, frozen, & processed 1/	77.9	97.7	2/1,070.3	24.8	28.2	309.6
Exports:						
Fish & shellfish: Processed only (excluding fresh & frozen)	4.8	5.4	68.0	2.0	1.5	22.8

1/Includes pastes, sauces, clam chowder and juice, and other specialties.

2/Revised.

United States exports of processed fish and shellfish in December 1960 were lower by 4.0 percent in quantity and 13.0 percent in value as compared with November 1960. Compared with the same month in 1959, the exports in December 1960 were down 11.1 percent in quantity but higher by 33.3 percent in value. The lower quantity of exports in December 1960 as compared with the same month in 1959 were due to a drop in the exports of California sardines and frozen salmon. However, the value of the December 1960 exports increased sharply due to higher exports of high-value canned salmon and canned and frozen shrimp.

FISH OIL EXPORTS IN 1960 DOWN SLIGHTLY:

United States exports of fish oils in 1960 totaled 71,830 short tons--a decline of less than one percent from the record of 72,240 tons set in 1959. Exports in 1960, as in 1959, consisted roughly of three-fourths of the fish oil produced in 1960.



Fish oil shipments to Europe (leading market area) dropped 5 percent, probably reflecting increased competition from Pe-

U. S. Exports of Fish Oils (Including Liver Oils) by Country of Destination, Averages 1935-39 and 1950-54, Annual 1956-60							
Country of Destination	1960 ^{1/}	1959 ^{1/}	1958	1957	1956	Average	
						1950-54	1935-39
(Short Tons)							
North America:							
Canada	4,923	1,920	6,485	1,228	1,621	2,707	458
Cuba	21	57	99	129	112	113	155
Mexico	290	223	123	56	63	109	45
Other	5	146	12	9	37	26	71
Total	5,239	2,346	6,719	1,422	1,833	2,955	729
South America	26	10	26	42	62	84	96
Europe:							
Belgium-Luxembourg	343	2,167	2,344	661	759	215	8
Denmark	10	577	-	-	866	-	-
France	20	40	5	5	-	273	19
West Germany	13,041	16,588	17,118	26,296	32,491	12,913	2/126
Italy	-	10	119	178	60	71	15
Netherlands	26,567	22,058	10,920	14,978	25,023	18,260	15
Norway	7,959	8,054	5,794	5,272	6,251	1,444	10
Sweden	18,013	20,355	3,370	7,716	2,646	-	7
Switzerland	-	-	558	794	367	4,994	15
United Kingdom	568	5	-	854	920	335	77
Other	13	-	-	-	-	25	8
Total	66,534	69,854	40,228	56,754	69,383	38,530	300
Asia:							
Philippines	2	-	-	7	10	585	66
Other	24	30	31	6	5	28	24
Total	26	30	31	13	15	613	90
Africa	6	-	17	305	24	25	19
Oceania	1	-	-	4	-	-	-
Grand Total	71,832	72,240	47,021	58,540	71,317	42,207	1,234
1/Preliminary				2/Total Germany			

1/Preliminary.

2/Total Germany

ruvian and Icelandic fish oils, plus an increasing use of vegetable oils in the manufacture of margarine. In most of 1960, soybean and cottonseed oils were relatively low-priced.

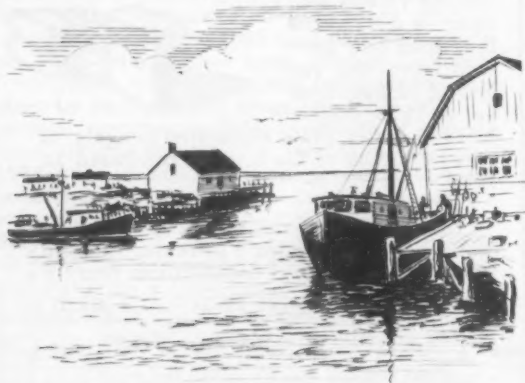
Fish oil exports to Canada were up sharply in 1960, due to the decline in production of herring oil in British Columbia.



Vessel Mortgage Insurance Program

FIRST APPLICATION APPROVED:

The U. S. Department of the Interior program for insuring mortgages on fishing vessels was inaugurated in January 1961, with the approval of the application of an Alaska salmon canner under the program.



The amount of the insured mortgage was \$75,000. It covered a loan made by a Seattle bank to Joseph R. Fribrock of the Snug Harbor Canning Company. The period of the mortgage is eight years. The company is building 10 gill-net vessels to replace fish traps which have been abolished in Alaska. The cost of the vessel construction is about \$105,000.

Under the mortgage insurance program the Department guarantees the lender or mortgage holder the insured amount. Should the borrower fail to pay, the Department pays but has legal recourse to the borrower's assets.

Authorization for the mortgage and loan insurance program was given the Department of the Interior in March 1958, when the fishing vessel mortgage program was transferred

from the Maritime Administration. It was not until July 1960 that Congress approved a method of financing the program should financing be necessary.

Persons obtaining mortgage insurance pay the Department one percent per year on the average unpaid balance of the loan. This money goes into a revolving fund which is available to pay claims. Should, at any time, the claim exceed the amount in the revolving fund, the Department of the Interior has the right to borrow the required amount from the Treasury.

The fishing vessel mortgage and loan insurance program is administered by the Bureau of Commercial Fisheries, Fish and Wildlife Service. The Bureau has administered a loan program for the replacement or repair of vessels and fishing gear for some years and also has authority for a vessel construction subsidy program.



Washington

PLANT OF TWO MILLION KING SALMON MARKS BEGINNING OF LARGE-SCALE FISH-FARM EXPERIMENT:

The more than two million fall chinook or king salmon fry planted in Washington's Capitol Lake, marks the beginning of the largest fish-farm experimental plant of young salmon ever conducted by a fisheries agency, the Director of the Department of Fisheries announced on February 17, 1961.

The two million salmon were put in the lake in mid-February and plants within the next month of an additional three million-plus young salmon will bring the total plant to more than five million.



All the young salmon were hatched from eggs taken from the 1960 fall run of chinook salmon to Capitol Lake and the Deschutes

River. The fry have been hatched and feeding started in hatchery ponds at the Simpson and Minter Creek stations before being put into the lake. Diet for the young fry while in the lake will consist of natural food such as insect larvae, small crustaceans, etc. along with a supplemental diet of hatchery fish food. The supplemental diet will be a special formula of the usual hatchery production diet, consisting of shrimp meal, herring, some beef liver, turbot, and other fish products. It will be processed and frozen into 50-pound blocks and placed in the lake at a number of feeding stations. With this procedure it is expected that the salmon growing in Capitol Lake will require less than half the feed they would in the hatchery ponds.

The fall chinook salmon run to Capitol Lake and the Deschutes has long been considered one of the most successful of artificially created runs. Last fall more than 10,000 adult chinook returned to the river. Prior to 1946, when the first plants of chinook were made in the lake, there were no runs of salmon in the Deschutes. Plants after that date, along with the construction of the three fish ladders in the stream, have made the Deschutes an important salmon producer, with an estimated 150,000 to 200,000 chinook salmon produced for sports and commercial fishermen in the State.

UNDERWATER EXPLOSIONS CAUSE LITTLE DAMAGE TO FISH:

Little damage to fish resulted from a series of underwater explosions set off by a California Oil Company along the east side of Whidbey Island during the third week in January 1961, the Director of the Washington State Department of Fisheries stated on February 3. He emphasized that no salmon were killed by the blasts. The seismic blasting was carried out by the oil company in a quest for oil around the Island.

Fisheries biologists observed all detonations and also observed preliminary test explosions in late December. Results of this test indicated that fish kills would be minor, an indication that was confirmed when the survey was conducted.

During January 16-20, a total of 196 90-pound charges of a special seismic blast powder (EP-198-B) were set off in the waters of Saratoga Passage between Penn Cove and Columbia Beach. Examination of the shot area for dead fish was made after each blast.

When possible, biologist skin divers checked for fish on the bottom. Diving was not feasible on many shots due to the muddy water and extreme depths.

Summary of number of blasts and fish kills observed is as follows:



January 16, North of Holmes Harbor--15 shots, 96-144 herring observed floating on surface; 360-480 herring estimated to have been killed and sank to bottom; 3 shiners killed--one floated, two sank.

January 17, North of Holmes Harbor--61 shots, 1 herring possibly killed, not recovered.

January 18, North of Holmes Harbor--10 shots, 1 true cod observed killed.

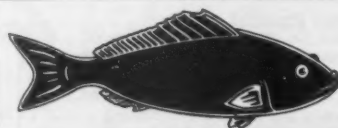
January 19, South of Holmes Harbor--67 shots, No fish kills observed; nine shots not checked, all in deep water.

January 20, North of Holmes Harbor--43 shots, 24 white perch, 1 copper rock fish and, approximately 12 herring were killed.



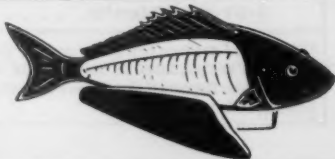
Wholesale Prices, February 1961

The February 1961 wholesale price index for edible fishery products (fresh, frozen, and canned) at 133.0 percent of the 1947-49 average was up 1.6 percent from the preceding month and up 9.2 percent from the same month of 1960. The rise from January to February this year was due mainly to



Whole or
Round Fish

Fillet





A busy day at the Boston Fish Pier. Trawlers unloading groundfish into boxes for weighing.

higher prices for frozen dressed halibut, fresh shrimp, and frozen haddock and ocean perch fillets. In February this year as compared with February a year ago prices were mixed, but substantially higher for most of the items listed in the index.

The fresh and frozen drawn, dressed, and whole finfish subgroup index in February this year declined 1.5 percent from the preceding month. This drop was due to seasonally lower prices for haddock at Boston--down 19.7 percent. As a rule, haddock prices at Boston reach the yearly low in February and March. Further increases in prices for frozen halibut and salmon plus some increases in the prices for fresh-water fish this February failed to offset the sharp drop in drawn haddock prices. As compared with February a year ago, this February's subgroup price index was up by 8.8 percent because frozen dressed king salmon prices were up 18.8 percent and frozen dressed Pacific halibut prices were up 9.6 percent. The increases offset the drop in prices for fresh haddock of 16.9 percent and for fresh yellow pike at New York City of 4.8 percent.

From January to February this year, the fresh processed fish and shellfish subgroup price index rose 6.3 percent due to a 18.6-percent jump in the fresh shrimp prices at New York City. This increase was partially offset by a drop of 14.1 percent in the prices of fresh small haddock fillets at

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1961 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/		Indexes			
			(\$)		(1947-49=100)			
			Feb. 1961	Jan. 1961	Feb. 1961	Jan. 1961	Dec. 1960	Feb. 1960
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					133.0	130.9	133.2	121.8
<u>Fresh & Frozen Fishery Products:</u>					148.9	146.2	150.0	134.9
<u>Drawn, Dressed, or Whole Finfish:</u>					160.2	162.7	173.6	147.2
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.12	100.5	125.2	178.0	130.9
Halibut, West., 20/30 lbs., drsd., fresh or froz.	New York	lb.	.32	.30	99.0	92.8	92.8	90.3
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.91	.90	205.0	202.2	202.2	172.5
Whitefish, L., Superior, drawn, fresh	Chicago	lb.	.75	.73	186.0	179.8	185.9	185.9
Whitefish, L., Erie pound or gill net, rnd., fresh	New York	lb.	.63	.63	126.4	126.4	151.7	136.6
Yellow pike, L., Michigan & Huron, rnd., fresh	New York	lb.	.69	.65	161.8	152.4	117.3	170.0
<u>Processed, Fresh (Fish & Shellfish):</u>					155.1	2/145.9	146.8	134.5
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.34	.39	114.0	132.7	175.2	139.5
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.88	.75	138.2	118.5	114.5	112.2
Oysters, shucked, standards	Norfolk	gal.	7.50	7.50	185.6	185.6	185.6	163.9
<u>Processed, Frozen (Fish & Shellfish):</u>					117.4	116.0	115.0	110.2
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	102.1	102.1	102.1	98.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.36	.35	113.0	109.9	106.7	97.3
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.31	.30	122.8	118.8	118.8	110.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.70	.70	108.0	107.2	106.5	104.1
<u>Canned Fishery Products:</u>					110.9	109.9	109.8	103.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.00	27.50	146.1	143.5	143.5	127.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.00	11.00	79.3	79.3	79.3	77.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.75	7.75	91.0	91.0	89.8	93.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.50	8.50	90.5	90.5	90.5	93.1

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/Revised from 146.0.

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/ Revised from 146.0.

Boston. In February this year, the subgroup index advanced 15.3 percent from February 1960. Higher prices for fresh shrimp (up 23.2 percent) at New York City and fresh shucked oysters (up 13.2 percent) at Norfolk more than compensated for the substantial drop (14.1 percent) in fresh small haddock fillet prices at Boston.

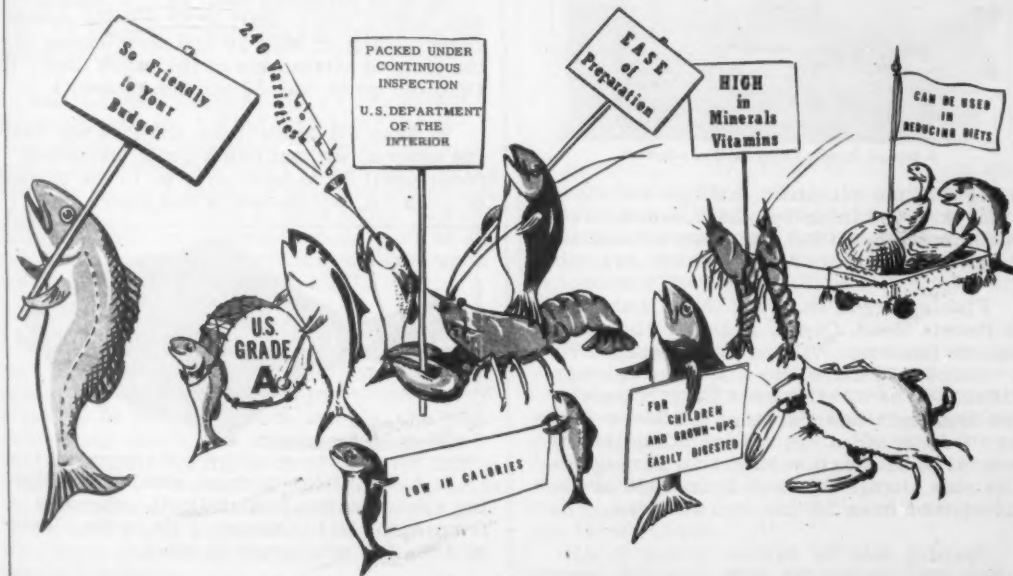
Wholesale prices in February this year for frozen processed fish continued to show a firm market for frozen fillets as compared with the preceding month and the late months of 1960. The over-all subgroup index rose 1.2 percent from January to February due to higher prices for frozen haddock and ocean perch fillets, and frozen shrimp at Chicago. From February 1960 to this February, the frozen processed fish and shellfish index rose 6.5 percent because of higher prices for

haddock fillets (up 16.1 percent), ocean perch fillets (up 10.8 percent), flounder fillets (up 4.1 percent), and frozen shrimp at Chicago (up 3.7 percent).

Canned fish prices continued the steady trend noted in recent months with the February 1961 index up about 1 percent from January due to an increase in primary prices (50 cents a case) for pink salmon (supplies are practically exhausted). Prices of the other canned fish items in the subgroup remained unchanged from January to February. However, from February 1960 to this February the subgroup index rose 6.8 percent due to a 14.3-percent rise in canned pink salmon prices and a slight increase in canned tuna prices. Canned Maine sardine prices this February were about 25 cents a case under those for February 1960.



FISH and SHELLFISH PARADE of VALUES





International

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT REGULATIONS FOR 1961:

Fishing for halibut will begin May 10 in all North Pacific areas except in Bering Sea and waters west of the Shumagin Islands, according to the recommendation of the International Pacific Halibut Commission to the Governments of the United States and Canada.



A typical Pacific Coast halibut schooner.

In light of the scientific findings and discussions with the industry, the Commission is recommending to the two Governments the following regulations for the 1961 season:

Fishing areas shall be: Area 1A--south of Heceta Head, Oreg.; Area 1B--between Heceta Head and Willapa Bay, Wash.; Area 2--between Willapa Bay and Cape Spencer, Alaska; Area 3A--between Cape Spencer and Shumagin Islands; Area 3B South--waters west of Area 3A, not including Bering Sea; Area 3B North--waters in Bering Sea. The only change in areas from 1960 is the division of Area 3B into two sections.

Opening date for halibut fishing in all areas shall be May 10 (at 6:00 a.m.), except in Areas 3B South and 3B North.

Opening date for Area 3B North shall be at 6:00 a.m., April 10; for Area 3B South shall be at 6:00 a.m., April 25.

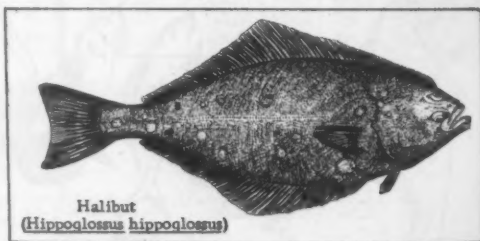
In Area 1A there shall be one fishing season, without catch limit, extending from 6:00 a.m. May 10 to 6:00 a.m. October 1 or to the closure of Area 3A, whichever is later.

In Area 1B there shall be one fishing season, identical in duration to that in Area 2, and without catch limit. (In the last few years there were two fishing seasons for this area.)

In Area 2 there shall be one fishing season, with a catch limit of 28 million pounds, commencing on May 10 and terminating at time of attainment of the catch limit. (In the last few years there were two fishing seasons for this area; in 1960 the quota for the first season was 26.5 million pounds and no quota for the second season.)

In Area 3A there shall be one fishing season, with a catch limit of 33 million pounds, commencing on May 10 and terminating at the time of attainment of the catch limit. (In 1960 the quota was 30 million pounds.)

In Area 3B South there shall be one fishing season, without catch limit, extending from April 25 to October 1 or to the closure of Area 3A, whichever is later.



In Area 3B North there shall be one fishing season without catch limit, extending from April 10 to October 1 or to the closure of Area 3A, whichever is later.

No areas shall be closed to halibut fishing that hitherto were referred to as nursery areas.

The Commission also announced that the 1962 annual meeting will take place at Seattle,

International (Contd.):

Wash., commencing January 16. The Commission has taken under advisement the possibility of meeting at other Pacific Coast ports from time to time.

Dr. William M. Sprules of Ottawa, Ontario, Canada, was elected Chairman and Andrew W. Anderson, of Washington, D. C., Vice Chairman for the ensuing year.

The International Pacific Halibut Commission early in February 1961 concluded its thirty-seventh Annual Meeting at Prince Rupert, British Columbia, with Chairman Andrew W. Anderson presiding.

While the Commission during the past 36 years has held Public Hearings in Prince Rupert and other British Columbian and Alaskan ports, this is the first occasion that it has held its Annual Meeting on the Pacific Coast other than at the headquarters of its scientific staff in Seattle.

Other members of the Commission are Dr. William M. Sprules, Vice Chairman; Harold Helland of Prince Rupert and Richard Nelson of Vancouver representing Canada; and Mattias Madsen of Seattle and William A. Bates of Ketchikan representing the United States.

The Halibut Commission is responsible to Canada and the United States for the investigation and regulation of the halibut fishery of the northern Pacific Ocean and Bering Sea. Its specific function is the development of the stocks of halibut to levels that will permit the maximum sustained yield, and its decisions regarding regulation are based upon the findings of its scientific staff.

During the past 29 years of Commission management, there has been progressive improvement of the stocks and increases in annual yield. The annual catch which had declined to 44 million pounds in 1931, the year before regulation, has averaged about 68 million pounds during each of the past four years. The 1960 catch of 71.8 million pounds, the highest annual catch ever taken, was worth nearly \$12 million ex-vessel to the fishermen and vessel owners of Canada and the United States.

At a public meeting on February 7, the Commission reviewed the past year's fishery and the research conducted by its scientific staff.

At several executive sessions the Commission dealt with administrative matters and approved the research program of the staff for 1961. It also held a session with representatives of the halibut fishermen's, vessel owners', and dealers' organizations. The suggestions for regulations in 1961 were discussed at that meeting.

Since in the past the United States and Canadian Governments have accepted the recommendations of the Commission without changes, it is fairly certain the 1961 regulations as recommended by the Commission will be approved by the two Governments.

Note: Also see Commercial Fisheries Review, April 1960 p. 33.

GREAT LAKES FISHERIES COMMISSION

UNIFORM FISHERY
REGULATIONS BEING DRAFTED:

Model legislation is being drafted to establish uniform regulations for commercial and sport fishing in the Great Lakes, following a meeting early in 1961 held in Ann Arbor by a special committee of the Great Lakes Fisheries Commission.



Essentially, the proposed legislation will give conservation agencies in each member state of the Commission power to regulate commercial and sport fishing under a standard set of rules, according to administrative procedures they must follow in their respective states.

The purpose of this is to provide another concerted approach to solving problems troubling Great Lakes fisheries. There are some marked differences in state regulations covering the same waters. The need for uniform regulations is also tied in with long-range efforts already under way to rebuild fish populations, particularly lake trout, in the Great Lakes.

GENERAL FISHERIES COUNCIL FOR THE MEDITERRANEAN

LEBANON BECOMES 13TH MEMBER:

Lebanon has become the 13th member of the General Fisheries Council for the Medi-

International (Contd.):

terranean (GFCM). The Mediterranean country joins France, Greece, Israel, Italy, Monaco, Morocco, Spain, Tunisia, Turkey, the United Kingdom, United Arab Republic, and Yugoslavia on the nine-year old Council.

The GFCM, Food and Agriculture Organization (FAO)--sponsored, will hold its next meeting in early 1963. The Council normally meets every two years, and met last at FAO Rome headquarters in September 1960.

The Council's task, broadly, is the development and proper utilization of the aquatic resources of the Mediterranean. It assembles and publishes oceanographical and technical information such as the GFCM Studies and Reviews, and undertakes cooperative research and development projects needed to provide information on the Mediterranean's aquatic resources.

At its last session, the Council adopted recommendations and resolutions calling for joint action in the field of tagging tuna, an oceanographic survey of the eastern part of the Mediterranean, and a study by FAO of technical problems related to preserving tuna fish and standardization of fish packing. A tentative catalog of Mediterranean fish was presented at this session and the Council voted to add and correct this catalog as well as to draw up additional catalogs of Mediterranean molluscs and crustaceans and freshwater fish.

Under GFCM rules, a request by an FAO member country to join the Council makes the country an automatic member.

JAPAN-SOVIET NORTH PACIFIC
FISHERIES COMMISSIONSCIENTIFIC-TECHNICAL SUBCOMMITTEE
TALKS OPEN 1961 SESSION:

The opening in Tokyo of the plenary sessions of the Japan-Soviet North Pacific Fisheries Commission, originally scheduled for January 23, 1961, was delayed until February 20, 1961, because of the illness of the Chief Soviet Delegate and Chairman of the Commission. Because of the delay in the opening of the regular meetings, Japanese and Soviet representatives of the Commission agreed to hold scientific-technical subcommittee meetings from February 6,

The first meeting was taken up with greetings, introduction of delegates, the exchange

of statistical data on salmon catch and other scientific-biological information, and the announcement that it had been agreed by Japanese and Soviet representatives that a United States observer would be permitted to attend the subcommittee sessions.

At the second and third sessions held on subsequent days, the Soviet delegation presented an explanation of the data which it had presented to the Japanese, to which the Japanese responded by asking a number of questions on methods used by the Soviet scientists in compiling the data.

In general, the press has reported that the Soviets have taken the position that: (1) there is evidence that salmon resources are decreasing each year; (2) 1961 should be a good year but it will not be as good as in past years because of the declining trend of salmon resources; (3) this declining trend of salmon resources has been particularly noticeable in the important Kamchatka area which accounts for roughly three-fourths of the Far East Pacific catch; (4) the concept of good and bad years is no longer valid because of the declining resources; and (5) the declining resources have been due to Japan's overfishing in areas outside the restricted zone.

According to the Japanese press, the Japanese have commented as follows on the Soviet position: (1) it appears that the Soviet side's conclusions with respect to the trend in salmon resources are based on its findings off the coast of Kamchatka; (2) the Soviet side appears to want to extend the restricted fishing area solely on the basis of its poor salmon catch last year; and (3) the Soviets are generalizing with respect to the nonrestricted area on the basis of the catch figure within the restricted area. The press reported also that the Japanese side plans to probe thoroughly the methods by which the Soviet data were obtained and compiled, and then to consider fully the adequacy of those data. (United States Embassy, Tokyo, February 10, 1961.)

MARINE OILS

WORLD PRODUCTION OF
MARINE OILS, 1957-61:

World production (estimated) of marine oils (includes whale and sperm whale oils and fish and fish-liver oils) in 1961 is expected to be about the same as in 1960.

Indicated increases in whale oil and sperm oil are expected to be offset by a smaller out-

International (Contd.):

Estimated World Production of Marine Oils, 1957-61					
Marine Oil's	1961 ¹ / ₂	1960 ² / ₂	1959	1958	1957
	(1,000 Short Tons)				
Whale	440	430	415	435	440
Sperm whale	125	115	125	135	110
Fish (including liver)	475	490	525	470	485
Total	1,040	1,035	1,065	1,040	1,035
¹ /Forecast					
² /Partly forecast.					

turn of fish oil. The larger estimates for whale and sperm oils reflect the addition of a new Soviet floating factoryship to the 1960/61 Antarctic fleet bringing the total to 20, one more than in 1959/60. Relatively low prices for fish oil and fish meal may discourage fish oil production in 1961. (Foreign Crops and Markets, U. S. Department of Agriculture, January 26, 1961.)

Note: Also see *Commercial Fisheries Review*, Feb. 1960 p. 60.

NORTH PACIFIC FUR SEAL COMMISSION

FOURTH ANNUAL MEETING:

The Fourth Annual meeting of the North Pacific Fur Seal Commission was held in Tokyo, January 30-February 4, 1961. The Standing Scientific Committee began its meetings on January 21, and the plenary session began on January 30. The meetings were held in an atmosphere of cooperation among the scientists, advisers, and Commissioners of the four delegations from Canada, Japan, the Soviet Union, and the United States.

Among the more interesting observations made by the Commission were that: (1) during the past year the numerical size of the herd on Robben Island and Commander Islands continued to increase; (2) progress was made in the management of the Pribilof herd; (3) there has been an increase in mortality among pups on the Pribilof Islands, in part because of overcrowding; and (4) there is evidence of considerable migration and intermingling of seals among the several seal islands--a considerable number of tagged Pribilof seals were found on Commander Islands, and a few as far away as Robben Island, east of Sakhalin.

The Commission reviewed the work of the scientists of the four countries and made plans for additional research to be carried on in the remaining period of life of the Convention. Plans were made for the drafting of a joint report which will eventually be

presented to the Governments of the four Parties. This report will be used as a basis for the establishment of a continuing agreement for the protection of the fur seals.

For the coming year, the U.S.S.R. Commissioner Aleksander A. Ishkov was elected Chairman of the Commission, while U. S. Commissioner Arnie J. Suomela was elected Vice-Chairman. The next Annual Meeting will be held in Ottawa beginning on February 7, 1962. The Scientific Committee will begin its meetings on January 29, 1962.

The Commission was established under the provisions of the 1957 Interim Convention on Conservation of North Pacific Fur Seals. The Commission has as its major responsibility the investigation of the fur-seal resources of the North Pacific Ocean. Each of the four countries contributes to the work of the Commission by carrying on investigations which will help determine the maximum sustainable yield from the fur-seal resources, with due regard for the productivity of other living marine resources in the area.

Investigations at sea will begin in early February on both sides of the Pacific. Investigations at the rookeries will begin in the early summer as the seals arrive at the end of their annual migration to the breeding



grounds. Under the provisions of the Interim Convention, commercial harvesting of seals at sea is prohibited. All harvesting is done on the breeding grounds under the control of the United States on the Pribilof Islands, and under the control of the Soviet Government on Robben Island and the Commander Islands. (United States Embassy, Tokyo, February 8, 1961.)

Note: Also see *Commercial Fisheries Review*, April 1960 p. 34.

International (Contd.):

NORTH PACIFIC SALMON

JAPANESE-SOVIET CATCH, 1960:

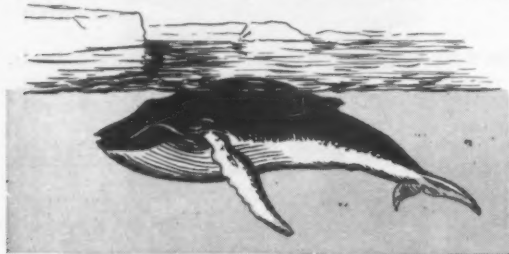
A total of 208,657 metric tons of salmon and trout were caught by Japanese and Soviet fishermen in the North Pacific in 1960. This was brought out at the scientific-technical committee meeting prior to the plenary session of the fifth meeting of the Japanese-Soviet North Pacific Fisheries Commission. Japan's catch was 139,157 tons and the Soviet's 69,500 tons.

Breakdown of the Japanese catch was 53,976 tons by mothership-type operations, 53,485 tons by drift nets, 9,213 tons by long line, and a coastal catch of 22,483 tons. (Fisheries Economic News, February 9, 1961.)

WHALING

JAPANESE-AUSTRALIAN HUMPBACK AGREEMENT:

Japan has agreed voluntarily to reduce the period during which her Antarctic whaling fleets will take humpbacks in Area IV from 4 to 2 days. This was announced by the Australian Minister for Primary Industry in Canberra on December 12, 1960. He said: "Talks on the conservation of humpback whales in the Antarctic have taken place in Tokyo between officials and whaling industry representatives of Japan and Australia. . . .



Humpback whale.

"Japan's decision could have great importance for the whaling industry on Australia's west coast, which depends for its humpbacks on the whale population that migrates each year up and down the west coast from its summer feeding ground in Antarctic Area IV.

"The other pelagic whaling countries are being notified of the outcome of the talks,

and continuation is being sought of the cooperative attitude which they evinced at the recent 12th meeting of the International Whaling Commission towards the conservation of the Antarctic humpback whales."

Humpback whaling in the Antarctic has normally been restricted to four days by the International Whaling Commission. At its annual meeting in London in June 1960 the Commission, on the initiative of Australia, decided that there should be no taking of humpbacks in Area IV for three years, and that the season for taking them in Area V (Australia's east coast whales) should be reduced from 4 to 3 days. Japan objected and the Australian-Japanese talks followed. (Australian Fisheries Newsletter, January 1961.)



Argentine Republic

FISH MEAL PLANT ACTIVATED AT PUERTO DESEADO:

The fish meal and oil plant in Puerto Deseado, Province of Santa Cruz, Argentina, has reportedly contracted the services of an established firm with several vessels to supply it with fish and was expected to begin operations. This plant, which was constructed in 1959, has remained idle for almost one year for lack of raw material because it had been unable to induce fishermen to work in Puerto Deseado. On January 25 the first contracted vessel arrived in that city; it has a carrying capacity of 75 tons. Two similar vessels were scheduled to arrive in February.

Various fishing organizations had indicated back in August 1960 that the Puerto Deseado plant would face a shortage of fish as well as fishermen. These sources claimed that the original estimates of the amount of fish to be found off the coast of Santa Cruz were unduly high. (United States Embassy, Buenos Aires, February 6, 1961.)



Australia

FREEZER-TRAWLER CONVERSION SCHEDULED:

A former British trawler (Southern Endeavour) from Hull, England, is to be converted into a freezer-trawler. Bought 12

Australia (Contd.):

months ago by a trawling firm of Adelaide, Australia, the vessel is at present engaged in experimental fishing in the Great Australian Bight.

A Hull man, who has been captain of the vessel on her experimental trips, returned to England and commented on the project: "It is too early yet to talk about results, but they are satisfied with the fishing part of the venture."

Much of the fish landed at Adelaide was snapper and flatheads, but some went by road transport hundreds of miles to the markets at Sydney and Melbourne. The captain went on: "The fresh fish market is finished, anyway. It is being abandoned there and the future is in frozen fish."

The marketing of the fish is to be the second stage of the venture, and freezing will naturally play an important role.

The captain is to buy the equipment in Britain and it is anticipated that the conversion of the trawler will take about six weeks. When completed, the freezing of the fish will make the vessel independent of special fish dock facilities and she will be able to land at any port. (Fish Trades Gazette, January 7, 1961.)

TUNA CLIPPER BOUGHT IN UNITED STATES ARRIVES:

The tuna clipper Favorite arrived in Sydney on February 2, 1961, from the United States. This is the first Australian-owned vessel designed specifically for tuna fishing.

An interesting feature regarding the purchase of this vessel (reported at about US\$340,000) is the fact that it came in under "by-law." Since this may have some bearing in the establishment of a pattern, there may be an opportunity for sales of other craft of this type in the future. It is understood that if this proves to be a helpful addition to the Eden, New South Wales, tuna fishing fleet, the firm operating the tuna canneries in Australia may be interested in purchasing additional vessels.

The vessel's refrigeration holds will carry 200 tons, or about 10,000 fish of 40 or 50 pounds each.

Its 600-hp. Diesel motor and its cruising range of 6,000 miles will enable the clipper to fish over a wide area, including waters now fished by foreign vessels.

The managing director of the Australian tuna canneries stated: "Tuna is migratory, and until now the catch has been limited to a short season when the schools are within range of local inshore fishing boats. This clipper will extend the fishing season and the canning season, and so reduce production costs."

"It will help reduce Australia's dependence upon the import of canned fish, and lead eventually to the development of an export trade."

The Favorite will also collect scientific data for the Fisheries Department to assist in the full assessment of Australia's tuna resources. (United States Consulate, Sydney, February 14, 1961.)



Belgium

FISH-MEAL PRICES, FEBRUARY 1961:

Belgium fish-meal prices early in February 1961 were slightly higher than a month earlier and were: Imported Meal: 65 percent protein, US\$78.65 per metric ton or about \$71.35 a short ton, c. & f. Antwerp (80-90 percent digestible). Domestic Whole Meal (fish solubles added): 62 percent protein, \$99.20 a metric ton or about \$90.00 a short ton f.o.b. plant (93-94 percent digestible). Domestic Regular Meal: 50-55 percent protein, \$69.50-76.45 a metric ton or about \$63.05-69.36 a short ton f.o.b. plant (about 90 percent digestible). (United States Consulate, Antwerp, February 7, 1961.)



Brazil

JAPANESE FIRM TO EXPAND TUNA FISHING ACTIVITIES:

Brazil's President has granted permission to the Japanese fishery firm operating out of Recife to expand its tuna fishing activities. At present six tuna vessels of the 300-400-ton class are fishing grounds located off Brazil from a base at Recife in Northern Brazil. About 10,000 tons of frozen tuna a

Brazil (Contd.):

year are processed for local consumption.
(*Fisheries Economic News*, January 31, 1961)



Burma

NEW FISHING COMPANIES ESTABLISHED:

An agreement between a Burmese fishing firm and a Japanese fishing corporation to establish a jointly-owned fishing company was signed on December 14, 1960. According to a newspaper report of December 31, 1960, the capital for the project has been fixed at 15 million kyats (US\$3.1 million). Profits will be shared on a 60-40 basis, with the Burmese company receiving the larger share. The Japanese firm will furnish the fishing fleet--two 240-ton motherships and 24 carrier and fishing vessels. The two motherships and four of the vessels were scheduled to arrive by the end of January, with fishing due to start in February. The Burmese partner is to undertake to obtain fishing licenses, meet local operating costs, and act as selling agent. Operations will take place along Burma's coast, and the motherships will cure fish and shrimp and manufacture fish paste on board, putting into port at long intervals to discharge the products.

Other newspapers report the formation of another fishing company, a joint venture of the Government's Defense Services Institute and a Singapore fishing company. The Institute is reportedly providing security and supervision through its Burma Fisheries Limited, and the Singapore company providing trawlers, crews, and equipment. According to a Rangoon newspaper (December 12), two vessels of the joint venture made a good catch of eastern shad weighing about 19,800 pounds on their first trip in December 1960, off the Cape of Negrois, Bassein District. (United States Embassy, Rangoon, January 6, 1961.)



Canada

FISHERIES LANDINGS, 1960:

Canadian marine fisheries landings during 1960 totaled 1,667.6 million pounds (val-

ued at C\$87.9 million) as compared with 1,948.4 million pounds (valued at C\$94.9 million) in 1959--a decrease of 14.4 percent in quantity and 7.3 percent in value. Lower landings of cod in the Maritime Provinces and both salmon and herring in British Columbia were primarily responsible for the

Canadian Marine Fisheries Landings, 1960				
Species	Landings		Value	
	1960	1959	1960	1959
	(1,000 Lbs.)		(C\$1,000)	
Atlantic Coast:				
Cod	603,392	642,312	16,823	17,113
Haddock	95,322	111,949	3,690	4,971
Pollock	57,608	46,302	1,262	919
Alewives	7,674	11,723	143	186
Herring	243,332	234,001	3,681	3,364
Lobsters	50,072	45,631	18,041	17,322
Pacific Coast:				
Halibut	1/33,477	2/30,908	1/5,433	2/5,800
Salmon	74,036	106,376	17,012	20,503
Herring	186,588	444,032	2,702	7,359
1/Including 6,750,000 pounds (C\$1,123,000) landed in U. S.				
2/Including 7,110,000 pounds (C\$1,402,000) landed in U. S.				

lower landings in 1960. Increases in the 1960 landings of Atlantic Coast-caught pollock and lobsters and West Coast halibut partially offset the sharp decline in the landings of cod, salmon, and herring.

NEW BRUNSWICK FISH MEAL PRICES, MID-FEBRUARY 1961:

Since the latter part of 1960, both the domestic and export prices of fish meal on Canada's east coast have increased by about \$9 a ton.

Fish meal prices (60 percent protein) quoted by three of the largest New Brunswick dealers in mid-February this year ranged from C\$81-84 a short ton (\$1.35-1.40 a protein unit) f.o.b. shipping point. Prices for export were the same as prices to domestic users.

One firm reported a price of \$91 a ton (\$1.40 a protein unit) for 65 percent protein meal.

Another firm reported that because of high freight costs they were unable to sell fish solubles competitively and they did not produce any. (United States Consulate, Saint John, N. B., February 14, 1961.)

USE OF MARINE OILS IN EDIBLE PRODUCTS DECLINES:

As Canada's margarine and shortening industries continue to expand, the use of marine

Canada (Contd.):

Canada's Use of Marine Oils in Margarine and Shortening 1957-1960					
Item	Jan.-July		1959	1958	1957
	1960	1959			
 (Million Lbs.)				
Margarine:					
Production	91.3	81.6	152.2	145.6	130.6
Marine oils used	6.4	7.6	12.8	19.8	17.1
Percent (%)	7.0	9.3	8.4	13.6	13.0
Shortening:					
Production	90.0	89.5	160.1	163.3	152.0
Marine oils used	2.6	3.2	5.1	16.7	26.4
Percent (%)	2.9	3.6	3.1	10.2	17.3
Note:	Data are on refined-oil basis.				

Note: Data are on refined-oil basis.

and fish oils by those industries decreases. Increased competition from other fats and oils (especially soybean and cottonseed) is largely responsible for this decline. (U. S. Foreign Agricultural Service Report, Ottawa, Canada, October 7, 1960.)

REACTIVATION OF BRITISH COLUMBIA WHALING INDUSTRY IN 1961 DOUBTFUL:

Negotiations between the British Columbia whaling firm and the fishermen and allied workers union over a contract leading to resumption of operations by the whaling firm failed when the union rejected the company's final offer.



Cutting whale blubber into chunks for the "digesters." History of British Columbia whaling goes back to the early part of the century when as many as 1,000 whales were taken annually by several whaling stations. Only one station has been in operation in recent years.

The industry, shut down since 1959, was hopeful that agreement would be reached, thus permitting the whaling fleet to put to sea. Bargaining, however, broke down when the union rejected the company's demand for a two-year contract and a revised agreement not open to review during the life of the contract.

The proposed operation was a joint venture, involving not only the British Columbia firm, but a Japanese company which sought to import the whale meat into Japan for human consumption. (United States Consulate, Vancouver, February 8, 1961.)



Denmark

FISH MEAL PRICES, JANUARY 29-FEBRUARY 4, 1961:

Export prices for Danish herring meal were being quoted at 850-890 Danish kroner per metric ton (US\$111.81-117.08 a short ton) f.o.b. Esbjerg, during the week of January 29-February 4, 1961. Protein content averaged about 70 percent. Prices for the week ending January 7, 1961, were 783-787 Danish kroner per ton (US\$103.00-103.53 a short ton), and one small order of higher protein herring meal for Switzerland brought 865 kroner a ton (US\$113.80 a short ton).

Prices quoted for the week ending February 4, 1961, were 9.0-12.7 percent higher than those for the week ending December 10, 1960.

There were no export sales of fish solubles during the week ending February 4, 1961. (United States Embassy, Copenhagen, January 18, 1961.)

FISHERY TRENDS, 1960:

The decline in the quantity and prices of Danish landings of industrial fish--declines which have been due primarily to the loss of export markets because of Peruvian competition--continued during the final quarter of 1960. Fish meal exports dropped 47.5 percent, or from 59,000 metric tons in 1959 to only about 31,000 tons in 1960; the decline in value was even greater (63.6 percent), from 74 to 27 million kroner (US\$10.7-3.9 million).

Denmark (Contd.):

Exports of most varieties of fresh and frozen fish increased, however, rising in value from 275 million kroner (US\$39.9 million) in 1959 to about 300 million kroner (US\$43.6 million) in 1960. During 1960, the United Kingdom, Germany, and Sweden remained the best customers for Danish fish products, with sales to the United States, especially of rainbow trout and frozen fish fillets, dropping appreciably.

Greenland fisheries increased output substantially, especially production of frozen fillets and canned shrimp. Faroese fish exports continued to rise, with ever-increasing emphasis on fresh, salted, and frozen fish and less on dried cod.

Fishing interests in the Faroe Islands ordered five steel vessels from an East German shipyard when the East German authorities let it be known that they would continue to import Faroese fish only if vessels were purchased from East German yards. (United States Embassy, Copenhagen, January 12, 1961.)

SALMON INDUSTRY OF DENMARK AND GREENLAND:

Small-scale salmon fishing, with a catch averaging about 100 metric tons annually, was pursued in eastern Baltic waters for many years prior to 1950 by Danish fishermen, primarily based on the island of Bornholm. In 1950 the catch jumped to over 1,000 tons, and annual landings have averaged around that figure ever since. Landings at Danish ports totaled 955 tons in 1959 and about 870 tons in 1960, with an additional 30 tons being directly landed by Danish craft in Swedish ports in 1959 and some 40 tons in 1960.

Almost all the Danish catch of the Atlantic salmon (*Salmo salar*) comes from the Baltic, especially from the waters between Öland and Gotland; northeast of Christian's Island; along the coast of Memel down to Brusteort; and around Danzig Bay. The salmon season is October-April, with the 1960/61 season's catch running about 50 percent higher than the preceding season, but on about the same level as during the 1958/59 season.

Comparatively little of the Danish salmon catch is consumed domestically, with more than two-thirds exported fresh or frozen. Most of the remainder is smoked, part of it for the export trade. Only minor quantities are canned.

Total Danish exports of fresh and frozen salmon exceeded 600 tons valued at about ten million kroner (about US\$1.5 million) in 1960. Sweden remains the principal customer for fresh salmon, but shipments of frozen salmon to France have become increasingly important.

Danish Exports of Salmon, 1960 ^{1/}						
	Fresh			Frozen		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Sweden	218	3,780	548	7	77	11
France	11	204	30	84	1,763	256
Switzerland . .	55	705	102	13	171	25
Finland	45	799	116	4	46	7
Norway	41	604	88	13	164	24
West Germany .	55	663	96	8	105	15
Netherlands . .	11	165	24	4	49	7
Belgium	12	182	26	-	-	-
United Kingdom	-	-	-	7	87	13
United States .	-	-	-	9	85	12
Italy	6	84	12	-	-	-
Others ^{2/}	1	8	1	8	48	7
Total	455	7,194	1,043	157	2,595	377

^{1/}Based on preliminary unofficial statistics from Ministry of Fisheries. This table includes 29 tons valued at 344,000 kroner (\$49,883) directly landed in Sweden, January-November. Statistics on direct landings in Sweden during December are not yet available, but such landings are estimated at 10-15 tons. The table also includes re-shipment of salmon delivered to Denmark from Greenland, but not direct exports from Greenland.

^{2/}Includes about one-half ton frozen salmon delivered to United States Armed Forces in Europe.

The major sales to the United States were during October, when almost 15,000 pounds of frozen salmon sold for 61,900 kroner (\$8,976); and during December, when 4,960 pounds brought 23,543 kroner (\$3,414).

Exports of frozen salmon have gone as far afield as Iran, Lebanon, Australia, Morocco, Liberia, and Czechoslovakia.

In addition, during 1960 some 90 tons of smoked salmon, valued at about 2.2 million kroner (\$319,000), were exported, primarily to Switzerland, Sweden, and France.

Denmark's wholesale trade in salmon is concentrated in the main fishing ports, especially at Bornholm, with the wholesalers also handling most of the export trade. How-

Denmark (Contd.):

ever, exports on behalf of individual fishing cooperatives are handled by a central agency, Dansk Andelsfisk.

Salmon fishing for commercial purposes is a very recent development in Greenland, and is the result of the planting of Atlantic salmon spawn in Greenland waters a few years ago. Production during the short September-December season is estimated at about 60 metric tons for 1960, as compared with less than 30 tons in 1959, and about ten tons in 1958. The increased production in 1960 permitted the sale and shipment to Gloucester, Mass., of 90,000 pounds of frozen salmon during December. This was the first (and so far, only) such sale to United States interests. The remainder of the catch was either frozen or salted and shipped to Denmark.

Det Gronlandske Fiskerikompagni A/S, which from its parent organization, the Greenland Trade Department, holds a monopoly of the Island's fish trade, is reluctant to estimate the 1961 season's catch closer than within a 10- to 100-ton limit. Uncertainty as to the run of the still comparatively small numbers of fish, coupled with the fact that the salmon season coincides with that of the economically-vital cod catch--and hence requires diversion from cod fishing--makes that reluctance understandable. (United States Embassy, Copenhagen, January 30, 1961.)



Ecuador

CANNED SARDINE
IMPORTS PROHIBITED:

Information from unofficial sources in Ecuador indicates that an unpublished regulation of the Ecuadoran Monetary Board dating from December 21, 1960, prohibits all imports of canned sardines for an undetermined period.

According to Ecuadoran importers of canned sardines, the prohibition of canned sardine imports is designed to protect Ecuador's production of canned sardines packed in tomato sauce. It is believed that the current prohibition of all canned sardine imports will be changed to a prohibition of imports of canned sardines packed in tomato sauce

and an increase in present duties on canned sardines packed in oil.

There is every reason to believe that the indicated prohibition of imports of sardines packed in tomato sauce and an increase in the duties on sardines packed in oil will substantially decrease such United States exports to Ecuador. The c.i.f. value of canned sardine and salmon imports by Ecuador in 1959 totaled 4.3 million sucres (US\$247,000), of which 3.8 million sucres (US\$218,000) represented imports from the United States. (United States Embassy, Quito, January 19, 1961.)

Note: Values converted at rate of 17.4 sucres equal US\$1.

PROFITS FROM SHRIMP
FISHERY DECLINE:

According to an officer of one of Ecuador's leading fishing companies, "this industry is sick." Although tuna fishermen do well, the dominant shrimp industry has declined since the 1953-54 boom year when shrimp brought US\$1.05-1.09 a pound. Two factors contributed to the decline: first, lower prices; and second, increasing competition. A third possible factor, the proposed United States import tariff on shrimp would, according to spokesmen, mean the end of the shrimp industry in Ecuador, which exports almost all production to the United States.

Following the big profits of 1954, the industry grew steadily in size and total catch. The increasing number of fishermen and declining prices, however, combined to make individual profits less, so that by 1958 conditions became difficult. During 1959-1960, three of the smaller shrimp-fishing companies failed. As a result of the series of lean years, during which needed repairs and maintenance to vessels were postponed, the fishing fleet is now reportedly in bad repair with some vessels idly anchored and others returning prematurely from trips, due to breakdowns, which cuts further into profitable operations. (United States Consulate, Guayaquil, January 31, 1961.)



El Salvador

SHRIMP INDUSTRY:

The Salvadoran shrimp industry is new, with first recorded production of any magnitude beginning in 1957. Fishing grounds ex-

El Salvador (Contd.):

tend along the entire Pacific Coast, with dispersion fairly general in the area. Catches drop about 10 percent in the months April-September, from levels of the rest of the year, but this apparent seasonal variation is based on only a few years' experience.

Shrimp are processed (frozen, and perhaps peeled and deveined) in four plants, one located in San Salvador, two in the port of El Triunfo, and one in the port of La Union. At present there appears to be little interest in further mechanization or additional processing such as breeding or canning. Local consumption of shrimp is believed to be well under 1 percent of exports to the United States (1960 basis), and exports to other countries are believed to be negligible. U. S. Customs records first reported shrimp from El Salvador in 1957. Since 1957 data from the same source show the following: 1958, 1,130,000 pounds; 1959, 1,838,000 pounds; and 1960, 6,699,000 pounds.

It is estimated that about 90 percent of landings in 1959 were Penaeus stylirostris (predominant) and Penaeus occidentalis.

Table 1 - El Salvador's Landings^{1/} of Shrimp by Size Classes, 1960

Size	Pounds	Percentage
Under 10's	1,530,230	25
10/15's	1,658,406	27
16/20's	612,203	10
21/25's	551,465	9
26/30's	586,729	9
31/35's	210,795	3
36/42's	113,125	2
43/50's	521,426	8
51/55's	283,205	5
56/60's	52,605	1
Whitemeat	87,275	1
Number Two	28,500	-
Total	6,235,964	100

^{1/}Data from Salvadoran fishing firm representing 42 vessels out of 66-vessel fleet fishing in 1960. Data believed to be representative of industry totals.

At the end of 1960 there were 66 vessels fishing in Salvadoran waters, according to trade sources. About seven older boats were 35 footers, with the rest roughly between 45 and 65 feet long. Almost all of the larger boats were made by a firm located in St. Augustine, Fla., and are equipped with a double rig. The entire fleet is Diesel-powered. Decisions to make additions to the present fleet will probably be deferred awaiting completion of the United States tariff discussions under way. If exports to the United States remain possible and financing is available, additions to the present fleet might be made through the purchase of additional United States vessels.

Ownership of the present fleet resides in Salvadoran companies, but there is some foreign capital (largely Panamanian, Mexican and Portuguese) in these firms.

There are no local export controls or subsidies on shrimp. Vessels using the port of El Triunfo pay a municipal landing charge of one centavo per pound (US\$8 per short ton) for all shrimp and fish brought in. The fishing companies are subject to the national corporation tax (5 percent), and stockholders pay graduated income taxes up to 44 percent on dividends received.

Dock workers, cleaners, and packers are paid at a rate of about 5 colones (\$2.00) per day. These wages are high by local standards, since most agricultural workers receive 2 colones (\$0.80) daily plus a meal.

Fishermen are paid from 300 to 400 colones (\$120-160) per month. Captains and ship mechanics receive considerably more, but their pay includes bonuses tied to the size of catches.

The trade estimates that the present 66-vessel fleet can expand production to about 12 million pounds a year. It appears likely that the total fleet size, which increased greatly in 1960, will not expand much in 1961, due to the threat of United States tariff action and also the need for existing companies to amortize their present large investments. Further expansion in later years will depend upon experience gained in foreign markets plus increased knowledge of the potential of the Salvadoran shrimp grounds.

The Salvadoran shrimp industry has created a new source of national employment which is important in a country of chronic underemployment. The industry-wide payroll probably covers about 900 individuals.

Table 2 - El Salvador's Employment in the Shrimp Fishing and Processing Industry (Based on 28 Boats Under Direct Management)

Job Title	No.
Captains	28 (1 per boat)
Mechanics	28 (1 per boat)
Fishermen	54
Port workers	25
Carpenters, land mechanics	25
General handymen	50
Packers, cleaners	150 (mostly women)
Administration	15
Truck drivers	5
Total payroll	390

As indicated in the country's sales pattern, the production side of the industry is

El Salvador (Contd.):

almost completely linked with the United States market. Basically the industry can only produce efficiently for export, since its final product is too high-priced to encounter much local demand.

It is also interesting to note that thus far, the industry has probably generated about the same value of United States exports as its over-all sales to the United States. The St. Augustine, Fla., shipyard sold 44 boats to Salvadoran firms. These vessels have cost, on average, nearly \$50,000 f.o.b. Florida each, or close to \$2.2 million for these vessels alone. Some of these vessels came here under Export-Import Bank financing, in an effort to encourage the new market for boat sales. Additional supplies and equipment are also imported from the United States. Through 1960 the Salvadoran shrimp industry probably spent about \$5 million for United States vessels, equipment, and expendable items. In addition, the fleet is a heavy user of Diesel fuel, which is marketed here

The principal objective of the new firm is to develop greater facilities for the production and distribution of frozen fish. At the present time, only a small percentage of France's total fish production is frozen and the facilities for marketing frozen fish are limited. According to reports, there were only 700 freezer cabinets in all the retail fish outlets in France at the end of July 1959. In view of the relatively large financial resources of the new company, the creation of Peche et Froid may have a significant impact on the marketing of frozen fish in France. (United States Embassy, Paris, December 9, 1960.)



German Federal Republic

FISH MEAL PRICES, FEBRUARY 8, 1961:

Prices reported on the Hamburg Commodity Exchange as of February 8, 1961, for fish meal delivered ex-Hamburg warehouse, or c. & f. West German sea port were as follows:

Type of Fish Meal	Protein Content (%)	Delivery	DM/Metric Ton	US\$/Short Ton
German fish meal	55-60	prompt/Feb. 1961	495.00	106.88
" " "	60-65	" " "	535.00	115.51
" " " std. brands	60-65	Feb.-Mar. 1961	570.00	123.07
Peruvian fish meal	65-70	prompt	490.00-500.00	105.80-107.96
" " "	65-70	Feb. 1961	455.00	98.24
" " "	65-70	Mar. 1961	445.00	96.08
" " "	65-70	April-June 1961	440.00	95.00
Icelandic herring meal	70-75	Feb. 1961	565.00	121.99

Note: Values converted at rate of 4.2017 deutsche marks equal US\$1.

only by United States oil companies. Thus, from an over-all viewpoint, the value of shrimp exports probably did not match outlays to United States firms until late 1960, if then. (United States Embassy, San Salvador, January 24, 1961.)



France

NEW COMBINE TO PROMOTE SALE OF FROZEN FISH:

Four French fishery firms operating in Boulogne-sur-Mer have united to form the Societe Peche et Froid. One of the most important producers of frozen fillets in France will head the new organization whose shares total some US\$3 million. The facilities of the new company include a fleet of fishing trawlers, two canning factories, a fish-freezing plant, and a commercial network equipped to handle frozen fish.

Fish meal prices on the Hamburg exchange on February 8, 1961, continued the upward trend for both domestic and imported fish meal that began in December 1960.

Note: Also see Commercial Fisheries Review, March 1961 pp. 59 and 60.

* * * * *

SHRIMP INDUSTRY:

Endeavors to develop peeling machines capable of processing small West German sand shrimp have so far not been successful. The shrimp industry employs "cottage workers" to peel shrimp. The financial situation of the shrimp industry is not good.

The 36 West German shrimp canneries employ conventional autoclaves and other canning equipment. Shrimp breeding is not carried on in West Germany.

Only an insignificant part of West German shrimp production was frozen as of Decem-

German Federal Republic (Contd.):

ber 1960 because of the lack of freezing equipment.

The shrimp catch is graded as follows:
(a) feed shrimp used for admixture in poultry feed (about 1,000-1,400 count heads-on, and
(b) edible shrimp for human consumption (about 200-250 count heads-on a pound).

ernization of vessels through subsidization of interest rates for commercial loans. The shrimp industry is making little use of such aid, because of its strained financial position and the uncertainty over the future of the West German shrimp industry due to the steady decline in shrimp landings.

Family ownership and operation of shrimp vessels predominate.

Table 1 - West German Shrimp Landings, 1956-1960

Year	Total Catch			Feed Shrimp			Edible Shrimp		
	Quantity ^{1/} Metric Tons	Value		Quantity ^{1/} Metric Tons	Value		Quantity ^{1/} Metric Tons	Value	
		DM1,000	US\$1,000		DM1,000	US\$1,000		DM1,000	US\$1,000
1960 (est.) . . .	24,600	7,220	1,718	21,000	2,540	605	3,600	4,680	1,114
1959	25,798	7,471	1,778	21,384	3,026	720	4,414	4,445	1,058
1958	28,471	8,545	2,034	22,313	2,482	591	6,036	5,616	1,337
1957	34,832	8,209	1,954	29,070	3,150	750	5,762	5,059	1,204
1956	32,888	7,183	1,710	27,476	2,858	680	5,412	4,325	1,029

^{1/}Heads-on weight.

The number of vessels engaged in shrimp fishing decreased from 674 in 1955 to 570 in 1960. About three-fourths of the present shrimp fleet consists of vessels of 30-40 feet in length powered by 40-50 hp. Diesel engines. The remainder ranges from small motor launches to 50-foot vessels powered by 75 hp. Diesel engines.

Currently, vessel operators pay DM 120 (US\$28.56) a metric ton for Diesel fuel, as compared to nonsubsidized consumers who pay DM 560 (US\$133.28) a ton. The Government subsidy to vessel operators amounts to a refund of excise tax and import duty totaling DM 368 (US\$87.58) per ton and an outright subsidy of DM 70 (US\$16.66) per ton.

The West German Government is prepared to facilitate the construction and mod-

There are no controls, subsidies, or taxes on the export of shrimp from West Germany.

Manual shrimp peelers are paid DM 0.14 (3 U. S. cents) per 500 grams (almost 18 oz.) of unpeeled shrimp. One worker peels an average of about three kilograms (6 lbs. 9.6 oz.) of shrimp per hour. Peelers are paid a bonus of DM 0.10 (2 cents) for every 50 grams (1.8 oz.) of shrimp delivered in excess of 1,500 grams (3 lbs. 5 oz.) of shrimp meat per 5,000 grams (11 lbs. 5 oz.) of unpeeled shrimp. Shells must be returned to the contractor.

Wages paid by West German fish cannery are as follows:

Unskilled workers performing heavy duties: under 18 years of age DM 1.59-DM 1.64 (US\$0.38-0.39) per hour; from 18-20 years of age DM 1.93-DM 1.97 (US\$0.46-0.47) per

Table 2 - Average Ex-Vessel Gross Income and Its Distribution for West German Shrimp Vessels with Self-Employed Fishermen, 1956-59

	1959 ^{3/}			1958 ^{2/}			1957 ^{1/}			1956 ^{1/}		
	Value		Percent	Value		Percent	Value		Percent	Value		Percent
	DM	US\$		DM	US\$		DM	US\$		DM	US\$	
	(Average Per Vessel)											
Gross proceeds of catch	16,716	3,978	100	21,900	5,212	100	18,722	4,456	100	15,929	3,791	100
Wages and social insurance . .	4,630	1,102	27.7	4,450	1,059	20.3	3,726	887	20	3,489	830	22
Fuel, oil, coal	1,270	302	7.6	3,460	823	15.8	3,060	728	16	2,657	632	17
Maintenance of vessel and gear	2,006	477	12.0	2,230	531	10.2	1,928	459	10	1,846	439	11
Vessel insurance	384	91	2.3	240	57	1.1	115	27	1	120	29	1
Interest on loans	251	60	1.5	310	74	1.4	271	64	1.5	196	47	1
Miscellaneous expenses	2,825	672	16.9	1,270	301	5.8	764	182	4	581	138	4
Depreciation	1,270	303	7.6	1,340	318	6.1	1,491	356	8	963	230	6
Net profit ^{4/}	4,079	971	24.4	8,610	2,049	39.3	7,367	1,753	39.5	6,076	1,446	38

^{1/}Based on a sample of 30 vessels.

^{2/}A larger sample in 1958, covering a total of 80 vessels, showed that the gross stock of the 30 vessels selected originally was somewhat above the over-all average of the larger sample.

^{3/}Based on a sample of 16 vessels.

^{4/}The average net worth of the shrimp fishermen's investments was estimated at DM20,000 (US\$4,760). The wage equivalent of the shipowner's work aboard his vessel is rated at about one-third the gross proceeds of the catch.

German Federal Republic (Contd.):

hour; over 20 years of age DM 2.08-DM 2.13 (US\$0.50-0.51) per hour.

Unskilled workers performing light duties: under 18 years of age DM 1.41-DM 1.46 (US\$0.34-0.35) per hour; over 18 years of age DM 1.54-DM 1.57 (US\$0.37) per hour.

Skilled fish workers: under 20 years of age DM 2.20 (US\$0.52) per hour; over 20 years of age DM 2.33 (US\$0.56) per hour.

Mechanics: DM 432.00-DM 504.00 (US\$103-120) per month.

The above wages are based on a 45-hour week. A premium of 25 percent is paid for overtime, and up to 50 percent per seasonal workers. Deviations by shrimp canners from the wages mentioned are small. The average hourly wage rate paid by shrimp canners is about DM 2.00 (US\$0.48).

Shrimp fishermen are paid 10-20 percent of the gross proceeds of the catch. Junior fishermen receive 5-8 percent of the gross proceeds of the catch. The cost of food is deducted from these shares.

Some segments of the industry believe that the normal cycle of high and low catches is lengthening, but that eventually the shrimp catch will increase. Others claim that the decrease in the shrimp catch is due to over-fishing, and to certain land reclamation projects along the West German North Sea coast. This group does not see any prospects for substantial improvement in landings.

Shrimp exports dropped sharply in 1960 because of the low catch. The bulk of the exports go to West European countries, because of high prices and good demand. Exporters believe they can become more independent

Table 3 - Average Prices of Shrimp Exports from Western Germany, 1957-1960

Annual Average	Salted Shrimp		Canned Shrimp	
	DM/Metric Ton	US\$/Metric Ton	DM/Metric Ton	US\$/Metric Ton
1960 (Jan.-Sept.)	2,486	520	6,410	1,671
1959 . . .	1,822	434	6,200	1,476
1958 . . .	1,915	456	5,942	1,414
1957 . . .	1/4,238	1,009	5,449	1,297

1/Higher average price due to greater percentage of peeled shrimp exports.

Table 4 - Exports of Salted Shrimp from Western Germany, 1956-1960 1/

Year	Quantity		Value	
	Metric Tons	Tons	DM1,000	US\$1,000
1960 (Jan.-Sept.)	68.0	153	36	36
1959	265.1	483	115	115
1958	343.6	658	157	157
1957	89.2	378	90	90
1956	93.4	284	68	68

1/Unpeeled and peeled. Exports to the Saar and Great Britain were peeled; exports to other countries were unpeeled. Bulk of exports in recent years shipped to the Netherlands and France.

from seasonal fluctuations in the shrimp catches by expanding their production of frozen shrimp. West German production of frozen shrimp in 1961 may amount to 200-300 metric tons. Export prices, f.o.b. West German sea port, for frozen shrimp in 1961 are expected to be as follows: frozen, cooked, unpeeled (about 600 heads-off shrimp per kilo or 272 count a pound), DM 2.80 per kilogram (US\$0.30 per pound); frozen shrimp, cooked, peeled (about 1,800 count heads-off per kilo or 816 count a pound), DM 9.50 per kilogram (US\$1.51 per pound).

West German exporters hope to sell frozen rather than canned shrimp to the United States, but not as long as prices for West German shrimp in West European countries continue to be as favorable. (United States Embassy, Bremen, December 20, 1960.)

Note: Values converted at rate of one Deutsche Mark equals US\$0.238.

Table 5 - Exports of Canned Shrimp from Western Germany, 1956-1960

Country of Destination	1960 (Jan.-Sept.)			1959			1958			1957			1956		
	Quantity		Value	Quantity		Value	Quantity		Value	Quantity		Value	Quantity		Value
	Metric Tons	DM	US\$	Metric Tons	DM	US\$	Metric Tons	DM	US\$	Metric Tons	DM	US\$	Metric Tons	DM	US\$
United States . . .	0.2	1	0.2	3.4	23	5	3.0	17	4	5.0	25	6	5.2	23	5
Belgium	2.7	25	6	28.7	201	48	17.5	123	29	2.5	14	3	-	-	-
Great Britain . . .	31.8	199	47	53.2	300	71	65.6	363	86	17.8	79	19	23.8	106	25
Netherlands . . .	52.2	411	98	104.9	635	152	173.7	1,026	245	-	-	-	-	-	-
Other	12.1	81	19	44.3	295	70	29.5	190	45	25.9	161	38	31.2	176	43
Total	99.0	717	170.2	234.5	1,454	346	289.3	1,719	409	51.2	279	66	60.2	305	73

Greece

IMPORT DUTY ON FROZEN FISH:

As of January 1, 1961, the Greek import duty on frozen fish will be 20 percent ad valorem. The duty was imposed to protect the domestic industry from foreign competition. (Alieia, December 1960.)



Guatemala

DECREE ESTABLISHES PENALTIES FOR ILLEGAL FISHING IN TERRITORIAL WATERS:

On December 13, 1960, there was published in the official gazette of Guatemala, *El Guatemalteco*, Congressional Decree No. 1412 dated December 6, 1960, establishing sanctions to be levied against foreign ships and aircraft which, without permission or licenses issued by the Guatemalan Government, fish in the territorial waters of Guatemala or cooperate in this activity.

Vessels and aircraft which engage in the type of activities indicated without the license or permit issued by the competent authority will be escorted to a Guatemalan port and detained, and the ship owners, captains, officers, and members of the crews will be punished as stipulated in the decree.

According to Articles 2 and 3 of the decree, the captain, or whoever is acting in that capacity, the officers and crew members, according to the circumstances, will be placed under arrest. This imprisonment will be commutable by payment of from Q1 to Q10 (US\$1-10) a day for the captain and officers and by payment of from Q0.10 to Q1 (10 cents to \$1) per day for crew members.

The ship owners will be fined from Q100 to Q5,000 (\$100-5,000), which fine must be paid prior to the release of the craft. The fine levied against the ship owners must be paid within 15 days or the craft will be sold at public auction.

The catch will be confiscated and will be immediately placed for public auction by the port captain or other person acting in that capacity.

Any other violation of the territorial waters of Guatemala committed by foreign

craft which are not exercising the right of innocent transit will be punished, without regard to the penal and civil responsibilities which arise, with a fine of from Q100 to Q10,000 (\$100-10,000), according to the seriousness of the infraction.

The penalties indicated above will be increased by one-third in each of the following cases: (1) if the craft fails to fly the flag of the country of its registration or if it lacks the documentation and registry which is required; (2) if the craft fails to obey immediately the orders or signals aimed at requiring the craft to put into port or for resistance to inspection; (3) if the craft or its crew carry firearms; and (4) if there has been repetition of infractions indicated by the decree.

The law entered into effect on January 13, 1961. (United States Embassy, Guatemala, December 14, 1960.)

GOVERNMENT GRANTS CONTRACT FOR FISHING IN TERRITORIAL WATERS:

A license to fish in Guatemalan territorial waters has been granted to a Cuban lawyer who is at present in Guatemala, according to the February 4, 1961, official Guatemalan gazette, *El Guatemalteco*. The license involves a contract between the licensee and the Guatemalan Under Secretary of Agriculture.

The license extended to the Cuban by the contract gives him the right to engage in fishing in general on a commercial scale off both the Pacific and Atlantic coasts within the twelve-mile limit of territorial waters claimed by Guatemala. The license is for ten years and cannot be transferred, even in part or entirely, to other persons.

According to the contract, any of the larger fishing craft which might be purchased by the Cuban for fishing off the Guatemalan coast must be registered in Guatemala; however, the craft which might be leased by the Cuban for use in his fishing operations can, according to the contract, maintain the registration of the craft's country of origin. He will be permitted to use foreign specialized technical personnel as necessary.

The contract authorizes him to operate either in his own name or in the name of a company which might be organized. The com-

Guatemala (Contd.):

pany will be permitted to import boats, industrial fishing equipment, machinery, materials, fuels, and lubricants for its operations, in accordance with the exemptions prescribed in the Industrial Development Law. The Cuban will be permitted to lease land on the sea coast where he can install the necessary facilities to carry on his fishing operations, such as freezing and refrigeration plants, warehouses, and similar installations. (United States Embassy, Guatemala, February 8, 1961.)



Hong Kong

SHRIMP INDUSTRY:

The Hong Kong shrimp-fishing industry is one of the many minor, but potentially expandable, economic pursuits that are carried on in the Colony. Within the fishing community the fishery for shrimp accounts for about ten percent of the total fishing fleet. The processing of shrimp by the Hong Kong fishing industry is not significant at present, because world market prices are not sufficiently high to make the Colony's products competitive overseas. Most of the catch is consumed locally, in the natural state. A large quantity of shrimp were processed during 1958 and the first half of 1959, when large exports of frozen shrimp were made to the United States. However, the local "processing" amounted largely to the repackaging of shrimp that had already been processed (including freezing) within Communist China. The Hong Kong fish-processing industry could be greatly expanded if the market situation changed; for there are several seafood canning and cold-storage plants, as well as the necessary capital, which could be quickly utilized for the processing of shrimp.

The main fishing grounds for Hong Kong's shrimp vessels lie to the south of the Colony, on either side of the Lema chain of islands, held by the Chinese Communists. Here the larger and motorized shrimp vessels will range as far as 40 miles from the Colony into waters up to 25 fathoms. But there is also considerable inshore shrimp fishing done within Colony waters and in the mouth of the Pearl River.

The main shrimp season usually runs from April through October, although in some

years it may begin in March. There is a slack season from November through March during which "white shrimp" are largely caught.

There are no plants in Hong Kong devoted exclusively to the processing of shrimp. There are at least five cold-storage plants which have the facilities for the quick-freezing of food products. At the height of the illegal shipments to the United States two years ago, there were about 10 companies processing shrimp for export. Now, there are reported to be only two such firms. The processing companies are of three types. The processor might own his own quick-freezing plant and employ workers at this plant to process the shrimp as well as other foods. The processor might lease space within a quick-freezing plant so that his employees would have a convenient place to perform their processing operations. Or, the processor might merely buy the shrimp on the local wholesale market, deliver them to a quick-freezing plant for processing by workers employed by the plant, and then take delivery of the frozen shrimp for export.

There are at present no machines installed in any Hong Kong quick-freezing plant to handle any shrimp-processing operation. One plant, however, did import peeling and deveining machines from the United States two years ago; but the imposition of the United States ban on imports of shrimp from Hong Kong after June 17, 1959, dissuaded this company from actually installing the machines. The latter are still presumed to be stored within the Colony and would probably be placed in operation, if the volume of shrimp exports ever justified it in the future. Under the same assumption, other quick-freezing plants here would probably also import shrimp-processing machines.

There are also local food-processing plants which sun-dry shrimp, make them into a shrimp paste, or incorporate them into a flour used for making noodles and chips. There are not known to be any shrimp-canning plants in the Colony.

There are no accurate statistics kept of shrimp catches. From the experience gained by the Colony's fish marketing officials, however, estimates of catches (heads-on) in recent years were: 1956, 5,200 short tons; 1957, 5,600 tons; 1958, 6,300 tons; 1959, 7,000 tons; and 1960, 6,700 tons.

It is estimated that 60 percent of the Hong Kong shrimp landings consists of the species

Hong Kong (Contd.):

Metapeneus monoceros, known in Cantonese as "commercial shrimp." This is a medium shrimp, yielding from 31 to 60 heads-off shrimp per pound. Species known only by their Cantonese common names as "red shrimp" and "red rice shrimp" account for about 30 percent of the catch; these species will yield 61 heads-off shrimp per pound. Species known only by their Cantonese common names as "flower shrimp" and "white shrimp" make up the remaining 10 percent of Hong Kong's shrimp landings--these species are large shrimp which will yield 30 or less heads-off shrimp per pound. The Hong Kong officials list the following species as being caught by Colony shrimp vessels: Metapeneus monoceros, Metapeneus affinis, Penaeus monodon, Penaeus bululus, Penaeus penicillatus, Solenocera sp., Metapenaeopsis novae guineae, Metapenaeopsis barbatus, Parapenaeopsis hardwickii, Parapenaeopsis hungerfordii, and Parapenaeopsis cornutus. These officials have been unable so far, however, to match these scientific names with the common Cantonese names, except for Metapeneus monoceros.

The 1960 landings declined, largely because of the destruction wrought by Typhoon Mary upon the Colony's fishing fleet in June and by the strong winds that prevailed in August and September, keeping vessels confined to the harbor. The statistics on shrimp catches do not represent estimates of the amounts of shrimp landed at Hong Kong, because since mid-1958 local shrimp vessels have been required to land part of their catches at Chinese Communist ports in the Pearl River in return for the privilege of using their traditional shrimping grounds, which lie outside of the Hong Kong waters. Thus, the amount of shrimp actually landed by Colony shrimp vessels at Hong Kong in the years 1958, 1959, and 1960 would be somewhat less than the catch figures shown.

At the end of 1960 there were 1,130 vessels known to the Hong Kong Government to be engaged in shrimp fishing. All are South China-style junks. Almost two thirds of these (740) are sailing vessels; the balance (390) are motorized. The size of the craft ranges from 24 feet to 52 feet in length, with the average boat about 39 feet. Those vessels that are motorized have engines varying between 6 and 72 hp., with the average about 40 hp. Beam trawls are mostly used, and

each craft tows from 7 to 9 trawls with 10-foot spreads. Some boats engage in pair-trawling in inshore waters.

There is no government-sponsored construction program to augment the Colony's shrimp-fishing fleet. Private plans are unknown, but would certainly appear if a sizable export market for shrimp were to develop.

All shrimp vessels operating from Hong Kong are owned by Chinese residents in the Colony. Such persons do not include Chinese with American citizenship. Most vessels are owned and operated by a single family group. However, there are also fleets owned by a single person or company who employs crews. One fleet is known to consist of ten vessels.

Data showing trends in export prices for shrimp actually caught by Hong Kong vessels is unavailable. One processor now exports under its own brand name quick-frozen local shrimp of the small variety (red shrimp and red rice shrimp) to Australia at 29 U. S. cents an 8-oz. package, c.i.f., heads-off, peeled and deveined. About ten tons a month of these "cocktail shrimp" are being shipped to Australia at present. The same processor exports the same size quick-frozen shrimp to the United Kingdom at from 63 to 70 U. S. cents a pound, c.i.f. heads-off, peeled and deveined.

Another processor exported these same small shrimp, cooked whole (heads-on) and then quick-frozen, to France in December

Type and Destination	Quantity		Value ^{2/}	
	Jan.-Oct. 1960	Year 1959	Jan.-Oct. 1960	Year 1959
	(1,000 Lbs.)		(US\$1,000)	
Fresh, chilled, and frozen:				
United States	-	514	-	364
Canada	188	118	88	55
Japan	67	-	29	-
South Africa	23	16	11	7
Australia	21	17	8	8
Other	31	163	15	105
Total	1/330	828	151	539
Salted, dried, and smoked:				
Philippines	22	-	2	-
Peru	22	15	6	4
Jamaica	15	12	9	8
Panama	14	11	8	6
Other	46	47	30	32
Total	119	85	55	50

1/Figures for January-October 1960 are exclusive of about 2 million pounds of re-exports of shrimp received from Communist China.

2/F.o.b. Hong Kong.

Note: Values converted at rates of: 1959, HK 5.76 = US\$1; 1960, HK 5.73 = US\$1.

Hong Kong (Contd.):

1960 at US\$1.02 a kilo f.o.b. Hong Kong or about 46 U. S. cents a pound. This processor stated that this price was now too high and he did not expect more business to develop.

There are no taxes on the export of shrimp, nor does the Hong Kong Government offer subsidies to persons and companies engaged in the shrimp industry. There was a certification procedure established by the Government to attest to the Hong Kong origin of shrimp destined for the United States, but this was suspended on June 17, 1959. Attempts are being made now to re-establish a new and tighter certification procedure that would prevent the abuses of the past.

Wages in the relatively dormant shrimp processing business are paid both on a daily and a monthly basis. A processor who hires his own labor but leases working space in a cold-storage plant states that he pays his washers, headers, peelers, deveiners, and weighers between HK\$6-7 (US\$1.05-1.23) for an 8-hour shift. (The cold storage plant manager thinks he only pays between HK\$5-6 (US\$0.88-1.05). Packers are believed to get slightly more because they must ensure that the shrimp are packed to the buyer's specifications. This same processor then pays the cold-storage plant an additional HK\$0.20 (3.5 U. S. cents) a pound for the quick-freezing service.

One cold-storage plant processes and packs Hong Kong shrimp under its own brand name. It has a permanent work force, which is employed at processing and quick-freezing other food products besides shrimp. This labor force is paid on a monthly basis, with wages ranging between HK\$200 and HK\$450 (US\$35.10-78.95); the average wage is HK\$250 (US\$43.85). In addition, the workers get many fringe benefits: free quarters, free medical service for themselves and their dependents, sick pay, 18 days' vacation per year, their uniforms, and a company contribution to a pension fund amounting to one-tenth of their wages. A supervisor earns about HK\$1,000 (US\$175.45) a month.

The vast majority of shrimp fishermen own and operate their own vessels. The income which they receive is controlled in most cases by the seafood wholesalers to whom they turn over their catch as payment against the debts they have incurred. No data are available on the prices paid by the wholesalers to the fishermen for the catches;

it is very likely that these values vary with the prices paid at the Government's marketing station and with the financial and personal relationships between each fisherman and his wholesaler source of credit. At the Government's wholesale fish market, fishermen received between HK\$152.39 and HK\$190.18 a picul (19 and 23.5 U. S. cents a pound) for their shrimp in the last seven months of 1957, when the Government first accepted shellfish for sale at its Aberdeen market; between HK\$118.28 and HK\$277.06 per picul (15-35.5 U. S. cents a pound) in 1958; and between HK\$183.46 and HK\$306.72 per picul (24.0-40.0 U. S. cents a pound) in the first six months of 1959.

The processor who owns a fleet of 10 vessels states that he pays an average of HK\$100 (US\$17.55) a month to the ordinary seaman and worker on his shrimp vessels. In addition, he pays for their food and gives the crew an incentive bonus amounting to 30 percent of the value of each catch marketed. The master of the boat gets about HK\$150 (US\$26.30) a month, plus his food and share of the bonus.

Without a profitable export market, there is little prospect for a significant expansion of Hong Kong's shrimp landings. Export data indicate that the Colony's exporters of shrimp have been successful in finding new markets for their products. The important United States market, however, will not reopen until a new certification procedure has been approved. Even then, the high price of Hong Kong shrimp may keep shipments well below the record levels of 1958 and 1959. (United States Consulate in Hong Kong, January 18, 1961.)



Iceland

FISHERIES LANDINGS DECLINE IN 1960:

During the first five months of 1960, Iceland's fishery landings indicated a year which would rival 1959. But during the last half of the year fishing was less successful in spite of more vessels in operation than in 1959 and in spite of considerable new equipment. Production of salted herring in 1960 may be only about half that of 1959, while herring oil and meal may amount to no more than two-thirds of the 1959 production. This sharp decrease in production means a loss in revenues, compared to 1959, of about 120 million kronur

Iceland (Contd.):

(about US\$3.2 million) calculated at 1960 prices.

More serious is the decline in world prices for herring oil and meal, as a result of Peruvian competition. Fish meal prices in 1960 were down 45 percent and oil prices were down 20 percent from 1959. In 1960, the probable decrease in value due to price declines when compared with 1959 will be about 175 million kronur (US\$4.6 million). The total loss in prospective revenues resulting from the decreased catch and the fall in prices will be nearly 300 million kronur (US\$7.8 million), according to Iceland's statisticians. This represents 12 percent of all export revenues. Some of this will be made up as a result of expanded markets for other products, but even this recouping will involve dislocations within the industry.

Iceland's fishing industry in 1959 reported record high landings--564,400 metric tons as compared with 505,000 tons in 1958 and an annual average of 441,100 tons for 1953-1959.

In processing the catch, the trend in 1959 was somewhat in the direction of stockfish and salted fish which are sold mainly for convertible currencies, and away from frozen fish intended for the Soviet Bloc. This trend would have a correspondingly favorable effect on Iceland's foreign exchange position with the hard currency countries. The trend, however, does not indicate the beginning of any fundamental shift in Iceland's trade.

It now appears to the Government that the fishing industry cannot return a profit without a thoroughgoing reorganization and rationalization of both its financial and operating aspects. This will require capital, the need for which had not been foreseen when the stabilization program was being planned. It will also require the transformation of present loans to the industry from short- to long-term loans. Financing will have to come almost entirely through the banking system as the industry has not built up any significant reserves to be used as working capital.

It is noteworthy that while the 1960 summer herring catch by Icelandic fishermen fell off sharply, the catch by Norwegian fishermen in the vicinity of Icelandic waters actually increased over 1959.

The fishing industry is by far the largest industry in Iceland, although the value of the catch amounts annually to only about one-fourth of the Gross National Product. Agricultural production comes next in size, with an annual value about one-half that of the fisheries. The fishing industry, however, accounts for about 92 percent of the value of tangible exports, with agriculture accounting for most of the remainder. (United States Embassy, Reykjavik, December 8, 1960.)

FISHING INDUSTRY PARALYZED BY LABOR DISPUTE:

The paralysis caused by the general strike in Iceland's Westman Islands failed to improve early in February 1960 as a result of good fishing weather or from a settlement of the dispute of the fishing vessel owners with the processors over the price and grading of fish. The end of the "lock-out" found the two shore unions determined to continue their strike. The fishermen and engineers continued their sympathy walk-out.

The fishermen's unions conducted negotiations with the Union of Icelandic Fishing Vessel Owners from mid-December until January 24 seeking to establish the wages and catch share of seamen for the winter-spring fishing season in Iceland's motorboat fleet. A deadlock in the bargaining led to intervention by the State Labor Mediator. Most unions walked out on January 15.

A settlement was reached January 24 on terms which approximated those in effect previously, but was rejected by several important unions.

The threatened walkout of the seamen's unions began January 15. A total of 38 local unions joined in the walkout, effectively stopping all motorboat fishing operations except for two unions on the Reykjanes peninsula, Keflavik, and Grindavik.

The various fringe benefits had been settled early in the talks, and the core of the dispute consisted of the guaranteed monthly minimum wage, and the percentage of the catch to comprise the fishermen's share.

The minimum monthly wage was settled on January 24 at 5,365 kronur (US\$141.10) for deckhands; 6,706 (\$176.38) for netmen, second engineers, and cooks; and 8,047

Iceland (Contd.):

(\$211.64) for first engineers. The fishermen's share was fixed at 29.5 percent of the gross value of the catch divided among: 11 crew members for short-haul line fishing; 10 crew members on Westman Islands boats; 13 crew members on long-haul line fishing; 10 crew members on boats of 30-39 tons engaged in short-haul net fishing; 11 crew members on boats above 40 tons engaged in short-haul net fishing; 12 crew members on motorboats engaged in long-haul net fishing.

Where the crews exceed the above numbers, the fishermen's share rises 2 percent for each additional member. On the smaller boats the crew receives 40 percent of the catch on boats of 12-18 tons, and 34 percent on boats of 18-30 tons. The crew share on trawling operations by the motorboats will be 31.5 percent and 37 percent in drag-net and lobster fishing.

The terms of the agreement, although difficult to compare with previous years, will in general bring the motorboat seamen about the same income as before. In the case of the Westfjords union, the new scale would amount to a slight decrease, while the Westman Islands fishermen will obtain a slight increase.

The new agreement was voted down by several important unions: Reykjavik, Hafnarfjörður, Akranes (unions in these three localities man 260 out of 340 motorboats over 30 tons in Iceland), Eskifjörður, and a number of smaller unions in the East and Westfjords. In general the continuing dissatisfaction applied more to the method of grading the fish than the catch percentage. The fishing vessel owners and the freezing and processing plants, in an effort to introduce quality controls, had reached agreement to base the price on the means used to catch the fish rather than on actual inspection.

The January 24 agreement was accepted by fishermen's unions in the Westman Islands, the villages on the Snaefellsnes and Reykjanes peninsulas, and a number of others. The Westfjords Federation of Labor reached tentative agreement with the owners on a local basis and commenced fishing January 29. Negotiations continue, however, with respect to a final contract. The seamen's unions are using the terms of the national agreement as a basis but are seeking a catch share of 33 percent. On February 19 agreements on fishermen's shares or wages were

reached at Reykjavik, Hafnarfjörður, and Akranes and this left only the Westman Islands with work stoppages still holding up production.

As of February 19 production was still at a standstill in the Westman Islands where the seamen's union was supporting the walkout of the shore unions. No indication of a settlement was in sight by mid-February, and the losses were mounting. The peak of the fishing season was approaching, and the cod and haddock landed by the Westman Islanders are one of Iceland's principal sources of foreign exchange. Production of frozen processed fish in the Westman Islands amounted to about 17 million kronur (\$447,000) between January 1-February 15, 1960. The winter fishing season has so far brought in good catches in areas not affected by the walkouts. (United States Embassy, Reykjavik, February 9 and 20, 1961.)

HERRING FISHERY TRENDS, JANUARY 1961:

Early in January this year the Icelandic winter herring fishing season was turning out quite favorably in regard to landings, and the quality and prices of the frozen, salted, and iced products. The fishing industry was filling contracts from the 1960 summer fishing season which had gone unfilled due to a poor season. Poland ordered another 20,000 barrels of salt herring and a large fleet of vessels began fishing against the wishes of the fishermen's union which had asked that the vessels tie-up for increased wages.

COD AND HADDOCK EX-VESSEL PRICES FOR 1961 BASED ON QUALITY:

The Association of Fishing Vessel Owners and Fish Processors agreed in January on prices to be paid for landed fish in 1961. These prices will for the first time be the same for the country as a whole.

Prodded by the Government, the fishing industry this year took a step towards introducing better quality control of their products by basing prices on the freshness of the fish. Heretofore the fishermen have been more concerned with quantity than quality, leaving the fish too long in the drift nets, and the consequent deterioration meant that the product was often unfit for the Western market.

Iceland (Contd.):

The tentative prices established for gutted cod and haddock with head on are: line-caught fish landed daily, 2.93 kronur per kilo (3.5 U. S. cents a pound); line-caught fish iced not over 4 days old, 2.80 kronur per kilo (3.4 cents a pound); best quality netted fish landed daily, and good quality trawler and line-caught fish iced not over 7 days old, 2.55 kronur per kilo (3.1 cents a pound); netted fish not more than two nights in the net, and iced fish over 7 days old, 2.22 kronur per kilo (2.6 cents a pound); other fish for human consumption, 1.66 kronur per kilo (2.0 cents a pound).

GOVERNMENT AID TO VESSEL OWNERS:

To provide the fishing vessel owners with some measure of relief, and to allow them additional flexibility in meeting the demands of the seamen, the Government in January 1961 took three steps: (1) the remaining amount in the Export Fund was devoted to payment of insurance premiums on the vessels, (2) interest rates on loans were decreased from 11 percent to 9 percent, and (3) on January 5, 1961, the Icelandic President signed a provisional decree authorizing the Fisheries Mortgage Fund to issue new type loans for the benefit of the fishing industry. The decree will permit extension of short-term loans and defaulted debts for capital equipment of the fishing industry, including machinery, real estate, and vessels into 10, 15, or 20-year loans. Prior to this the Government had abolished the 2.5 percent tax on fish products produced in 1961.

FISHING INDUSTRY SURVEY:

An extensive survey of vessels, processing plants, and machinery used in the fishing industry is under way in order to try to stabilize the rather chaotic finances of the industry. All bankruptcy proceedings are canceled pending the completion of the survey, but not beyond December 31, 1961. (United States Embassy in Reykjavik, January 12 and 16, 1961.)



Italy

INTERNATIONAL FISHING FAIR:

The XXI International Fishing Fair and the VII International Nautical Exposition will be held concurrently at Ancona, Italy, June 24-July 9, 1961. The Fair and the Exposition will have exhibits from many countries and will be attended by persons interested in fisheries and nautical subjects in general.

TUNA TRAP FISHERY POOR IN 1960:

Results of Italy's 1960 tuna fishing season were extremely poor. Catches by the Favignara, Isola Piana, and Porto Scuso tuna traps were only fair. All the other tuna traps caught only insignificant quantities.

The reason for the decline in catch is not known. Some attribute it to the fact that "blue-fish" schools (sardines and anchovies) remained offshore, and that consequently the tuna passed far from the tuna traps.

The results of the tuna-fishing season trap by trap were (in metric tons): Favignara 1,635; S. Cusumano 73; Bonagia 71; Secco 28; Scopello 82; Castellamare 64; Magazzinazzi 30; Solanto 51; Mondello (was not set up); Trabia 9; S. Giorgio 35; Oliveri 15; Tono 4; Isola Piana 1,450; Porto Scuso 1,600; Porto Paglia 900. (*Il Giornale Della Pesca*, July 1960.)



Jamaica

SHRIMP FISHERY SMALL AND UNORGANIZED:

The shrimp industry of Jamaica exists only to the extent that it is conducted by about 20 unorganized individuals. These fishermen catch shrimp throughout the year, but peak catches are made during April and May. The "industry" is primitive; there are no processing plants and none are contemplated. No data are available on the total annual landings of shrimp. The Jamaica Fisheries Officer states that the annual catch is "very small."

Of the approximate 900 dug-out canoes (some powered by outboard motors, some by sail, and some by paddles) which are engaged in fishing, not more than 20 are used in fishing for shrimp. These 20 (at the most) only seek shrimp during a relatively small por-

Jamaica (Contd.):

tion of their time. Shrimp are caught by cast nets from canoes, or by wading in shallow waters with hand nets and loading the catches into canoes.

The 20 shrimp fishermen, individually dispose of their shrimp to Jamaican consumers. There are no data on the income of Jamaican fishermen as a whole, or the income derived solely from shrimp sales by the 20 fishermen who fish for shrimp only as a part-time activity. No shrimp are exported from Jamaica.

Shrimp are caught in that portion of Kingston's harbor as lies westwardly from Kingston. The Fisheries Officer does not believe that this catch can be expanded; but he also stated that no one knows what potentialities may exist throughout Jamaica's entire coastline. In 1958 or 1959 there were attempts made by Jamaica-based fishermen to utilize the Central-American areas of the Caribbean coast, resulting in landings of about 20,000 pounds per month, which were shipped to the United States. Although this fishery was discontinued, there may be some prospect that this trade may be recommenced in the future. (United States Consulate, Kingston, March 2, 1961.)



Japan

ATLANTIC TUNA FISHERY TRENDS:

A Japanese exporting firm planned to deliver a total of 500 metric tons of frozen tuna to Yugoslavia by the end of January 1961. The shipment was to be picked up at Dakar, West Africa, by the Astru Maru, which was recently turned over to Yugoslavia. The sales price was \$290 a ton c.i.f. for albacore and \$280 a ton c.i.f. for yellowfin.

The European frozen tuna market for Atlantic Ocean tuna continued to hold firm. Albacore was selling for \$290 a ton in Yugoslavia. Yellowfin was selling for over \$280 a ton in Italy and Yugoslavia.

The higher prices are attributed to increased demand and longer vessel trips due to fishing grounds being located farther offshore. These prices were expected to prevail until about March 1961.

A large Japanese fishing company is planning to transship to Japan via Freetown, South Africa, about 300 tons of black marlin, broadbill swordfish, etc., in late February on an experimental basis. Plans call for utilizing commercial line vessels as carriers. Should this plan prove successful, other fishing companies are expected to follow suit.

The Japanese firm is making this move since the plan approved by the Japanese Export Frozen Tuna Fisheries Association to transship to Japan 10,000 tons of Atlantic-caught frozen tuna-like fish between April and July is not making much progress for the European tuna market has not only improved, but carrier space for shipping tuna to Japan is difficult to obtain as well.

The Japanese Export Frozen Tuna Fisheries Association had scheduled a special session on February 1 to approve officially the redesignation of the Nigerian port of Lagos as an intermediate port for transshipping Atlantic tuna to the United States. It is reported that several large Japanese fishing companies are conducting negotiations to have the Liberian port of Monrovia designated as an intermediate port also. (Shin Suisan Shimbun So-kuho, January 17, 21, 27, 1961.)

CANNED TUNA MARKET
PROSPECTS IN UNITED STATES:

The Japan Export Trade Promotion Agency (JETRO) early this year released a report concerning canned tuna market conditions in the United States. According to JETRO, to increase sales of Japanese canned tuna in brine Japan should first conduct promotional campaigns in selected areas, improve the quality of her products, as well as plan price increases.

The United States market can be divided into four major regions: (1) Northeast, (2) New York, (3) North Central, and (4) Pacific Coast. Northeast leads in total sales of canned tuna, garnering 25 percent of the market, followed by North Central with 23 percent. However, the Pacific Coast leads in the per capita consumption of canned tuna.

In the Pacific Coast region, chunk-style packs make up the largest proportion of all canned tuna found on the market. As for solid-style packs, name United States brands make up an overwhelming part of that market.

Japan (Contd.):

Outlook for increased sales in that region does not appear bright. Japanese products face a disadvantage from a transportation standpoint in competing with United States canned tuna on the Pacific Coast. For these reasons, effective promotional results in that area are doubtful.

However, prospects for increased sales in the North Central region look good. With improved living standards, consumption of tuna has shown an increase. This, plus the fact that the region is densely populated, makes it an ideal place for conducting an effective promotional campaign. The market for solid-style packs in that region is already controlled by name brands and efforts should be directed toward the sale of chunk-style tuna. However, care should be taken not to saturate the market with too many brands. (*Nippon Suisan Shimbun*, February 6, 1961.)

CHANGES IN 1961 TUNA MOTHERSHIP REGULATIONS REQUESTED:

On January 2, 1961, the Tuna Mothership Council composed of the leading three Japanese fishery firms submitted a petition to the Ministry of Agriculture and Forestry requesting changes in 1961 tuna mothership regulations. The petition recommended the following changes: (1) increase present catch quota of 13,600 metric tons to 40,000 tons, (2) eliminate area restrictions, (3) relax catcher-boat size restrictions, and (4) restore use of portable catcher boats.

Although not expecting full acceptance of its recommendations, the Tuna Mothership Council hopes to have at least some part of its proposals accepted. However, the Japanese periodical *Suisan Tsushin* (February 6, 1961) reports that according to a responsible Fishery Agency official, there will be no major changes in existing tuna mothership regulations and that only the regulation pertaining to size restriction of tuna fishing vessels shall be revised.

Present size restriction on tuna vessels allows only catcher vessels of 200-gross tons or less to engage in mothership-type operations. The Government decree made public late last year concerning the relaxation of rules on enlargement of medium-size fishing vessels to larger-size vessels

has led to a flurry of conversions, from medium to large vessels. As a result, tuna mothership fleets are faced with the problem of catcher vessel availability. The Tuna Mothership Council hopes to have this restriction lifted so larger catcher vessels can be employed.

At present, five motherships with a total of approximately 150 catcher vessels are engaged in tuna fishing. The present tuna mothership catch quota of 13,600 tons when split five ways is only 2,720 tons per fleet, which makes it impossible for a fleet to operate profitably. The mothership companies have continued operations by augmenting their quota by an additional 9,300 tons acquired through an agreement to lay up their fishing vessels (from participating in the coastal tuna fishery) for corresponding periods during the remainder of the year.

Although tuna landed by tuna vessels in other categories have continued to increase (for example, from 160,000 tons in 1954 to 380,000 tons in 1959, with further increases in 1960), tuna mothership landings have been restricted despite increases in the number of mothership vessels participating in the tuna fishery.

Area restrictions also are hampering mothership operations, for this has prevented motherships from utilizing to their full capacity their unique characteristic of mobility. At present, the mothership fleets are restricted to the following areas: North of the equator - east of 170° W. longitude; equator to 25° S. latitude - east of 170° E. longitude; and south of 25° S. latitude - east of 160° E. longitude.

Concerning the utilization of portable catcher vessels, precedent for this practice had already been set in earlier years (1951 and 1953) and industry hopes to have their use revived again. (*Suisan Keizai Shimbun*, February 4, 1961; *Suisan Tsushin*, February 6, 1961.)

EXPORTERS DRAFT PROPOSALS ON CANNED TUNA EXPORTS TO U. S.:

The Japan Canned Food Exporters Association's standing committee on tuna recently met to discuss policies on sales of canned tuna in brine to the United States. The following resolutions, which are to be used as basis for negotiations with producers, were adopted:

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Japan (Contd.):

1. Sales quota for January to March 1961 shall be 600,000 cases, April to June 900,000 cases, and July to September 500,000 cases.

2. Present sales prices should be maintained as much as possible.

3. In addition to the producers' share of the export quota (50 percent of total exports), about 20 percent of the quota allotted to each exporting firm shall be submitted for readjustment. (Nippon Suisan Shimbun, January 27, 1961.)

EXPORTERS DRAFT PLAN FOR REGULATED EXPORTS OF FROZEN TUNA TO U. S.:

The Japan Frozen Foods Exporters Association recently drafted a plan regulating frozen tuna exports to the United States. According to this plan, total exports of all frozen tuna, including albacore, yellowfin, skipjack, bluefin, etc., to the United States are fixed at 100,000 short tons, with direct exports from Japan proper limited to 65,000 tons and transshipments 35,000 tons.

The 65,000-ton quota for direct shipments from Japan is to be allotted to companies on the basis of their records for the preceding three years. Each of these companies is to release half its quota to the Frozen Foods Exporters Association, which shall then distribute this half, as requests are received, to firms that have completely used up their quotas on hand. In the case of transshipments, the 35,000 tons shall also be distributed to companies on the basis of their records for the preceding three years but this entire quota shall initially be placed in the custody of the Association. The Association shall then release this quota to these companies as requests are received from them. (Suisan Tsushin, February 22, 1961.)

EXPORTS OF FROZEN ALBACORE TO U. S. MAY INCREASE:

The Japanese Export Frozen Tuna Fisheries Association's board of directors met on January 19, 1961, to study the Association's proposal, which was adopted on January 12, to increase the present frozen albacore tuna export quota of 30,000 short tons to the United States. The board ap-

proved an increase of 5,000 tons and this increase was to be submitted for formal approval at a special general session to be held on February 1. (Nippon Suisan Shimbun, January 23, 1961.)

FROZEN TUNA EXPORTS TO U. S. S. R. BEING EXPLORED:

The president of a Japanese fishery firm met with the Russian Fisheries Minister on January 26-27, 1961, to discuss the possibility of exporting frozen tuna to the Soviet Union. For the purpose of exploring this matter more fully, the Russian Minister has agreed to hold an informal conference at the Soviet Embassy in Tokyo at some later date.

The idea of exporting frozen tuna to the Soviet Union has gained considerable support lately in Japan. Hope is held for industry-wide participation in the plan to export tuna to the Soviet Union, which would help alleviate the glut in the Atlantic tuna market occurring during the summer months.

However, little is known about the import structure within the Soviet Union and an organization to handle exports to the Soviet Union does not exist within Japan. For these reasons, the Japanese tuna industry has not yet been able to get together on this plan.

Opinions are being expressed that industry would have a difficult time to go it alone and that the Japanese Government should take an active role in promoting this idea. (Suisan Keizai Shimbun, February 2, 1961.)

NATIONAL TUNA RESEARCH COUNCIL PLANNED:

Preparations have been under way in Japan for some time to organize an association called "National Tuna Research Council" (provisional name) and the first meeting of this group was scheduled for March 1, 1961, at which time the draft pertaining to the formation of this association is to be adopted. This meeting is sponsored by the Japanese Fishery Agency, Japan Fisheries Society, and the Tuna Federation and shall be attended by representatives from leading tuna-producing prefectures and from tuna research organizations.

The association's objective is to strengthen bonds between existing tuna organizations

Japan (Contd.):

through Government and industry cooperation, and to promote tuna research and improve tuna-processing methods. Their program calls for:

1. Holding technical meetings to discuss matters such as improving efficiency of fishing operations and fishing gear, developing better baits, improving quality of tuna products, and developing new products.

2. Holding an annual meeting for the purpose of exchanging views of members and interested parties on tuna problems, and reporting on progress of research undertakings.

3. Scheduling meetings every other month of regular members (composed of people from Government and private research organizations and educational institutions) and associate members (tuna industry personnel) to compile, compare, and exchange data on research in progress.

Special committees such as on research, production methods, and fishing techniques are to be established.

Plans call for holding the first annual meeting of the "National Tuna Research Council" in November 1961 for a two-day period. (*Suisan Tsushin*, February 22, 1961.)

NEW CANNED TUNA PRODUCTS DEVELOPED:

A large Japanese fish canner announced late in January 1961 that it has added two new canned tuna products to the items they now offer. The firm expects to sell the new products in large cities. One of the new products is "creamed tuna," which contains tuna meat, green peas, potatoes, and carrots in white sauce. The other kind contains pickled tuna meat, green pepper, cauliflower, cucumber seasoned with tomato sauce, and salad oil. (*Fisheries Economic News*, January 30, 1961.)

PACKERS TO TRANSSHIP FROZEN ATLANTIC TUNA TO JAPAN:

The Export Frozen Tuna Packers Association's board of directors met on February 24 to discuss transshipment of frozen Atlantic tuna to Japan and adopted the following proposals:

1. About 1,000 metric tons of Atlantic tuna shall be procured through the joint sales company and transshipped to Japan.

2. Price shall be \$190 per metric ton for yellowfin and \$250 per ton for swordfish, with delivery at Monrovia, Liberia.

3. A large Japanese fishing company shall arrange for the transportation of 690 tons to Japan and will purchase the entire amount upon delivery. The remaining tonnage (about 310 tons) shall be allotted to any member company in the association who wants to transship tuna to Japan but the company must bear all expenses. (*Suisan Tsushin*, February 25, 1961.)

RESEARCH VESSEL REPORTS GOOD TUNA FISHING OFF ANGOLA:

The Japanese Fishery Agency's research vessel *Shoyo Maru* (which returned to Tokyo on February 12 after spending a month exploring fishing grounds off west and north-west Africa) reported good fishing off Angola in the area to the north of 10° S. latitude, 5° E. longitude.

From October 21 to November 9, 1960, the *Shoyo Maru* operated in the area formed by lines connecting the following positions: 10° S., 5° E.; 10° S., 5° W., and 10° N., 20° W. Within the confines of this area between 10° S. latitude and 5° S. latitude (off Angola), albacore predominated in the catches, averaging 6.7 fish per 100 hooks, followed by big-eyed and yellowfin in abundance; between 5° S. and the equator yellowfin averaged 4.7 fish per hundred hooks; and between the equator and 10° N. latitude, 3.4 fish per hundred hooks.

From November 19 to December 8, the *Shoyo Maru* operated near the Cape Verde Islands in the rectangular area formed by the following positions: 15° N., 20° W.; 15° N., 40° W.; 25° N., 20° W.; and 25° N., 40° W. Dividing this area into three general groups, north, south, and west, the *Shoyo Maru* reported catches of 1.8 fish, 3.7 fish, and 3.0 fish per 100 hooks in each of those respective areas. At least for the period indicated, fishing was poor near 25° N. latitude. (*Shin Suisan Shimbun Sokuho*, February 22, 1961.)

THIRD SALE OF CANNED TUNA IN BRINE FOR EXPORT TO U. S.:

The Tokyo Canned Tuna Sales Company held the third sale of canned tuna in brine (150,000 cases) for the United States market beginning February 25. As before, whitemeat

Japan (Contd.):

was priced at US\$9.15 a case and lightmeat at \$6.80 a case f.o.b. (Suisan Keizai Shimbun, February 25, 1961.)

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TUNA FISHING INDUSTRY FACES PROBLEMS:

The Japanese pelagic tuna-fishing industry will have to face a number of problems in 1961. Since mid-1960, albacore tuna have been caught in the Atlantic and development of a market for these fish will be a problem for the industry this year. Also, mothership-type tuna fishing has reached the stage where a new operating policy to make operations profitable is needed, and new procedures are needed for transshipped tuna exports. A Japanese article states that unless the tuna industry deals with these problems with new concepts in mind, frozen tuna exports will not expand further.

Japanese tuna vessels operated in the Atlantic for the first time and exported their catch to Italy in the spring of 1957. Four years later, more than 60 vessels were fishing there and in 1960 albacore began to be caught with yellowfin. About 5,000 metric tons of Atlantic albacore were exported in 1960. Albacore was caught with yellowfin off the coast of Brazil, around 10° S, latitude off Recife.

The problems of Atlantic tuna in the past three years were concerned with the sudden increase in vessels, increased yellowfin tuna exports to Italy, and development of new markets. Inasmuch as yellowfin had been considered to be the mainstay of exports from the Atlantic, how to sell Atlantic albacore to the European market became a problem.

Exports of Atlantic albacore were offered at around \$250 per ton f.o.b., exactly the same price as yellowfin for export to Europe, but \$300 per ton was the price for export to the United States. As far as exports to Europe were concerned, they were not particularly attractive. Accordingly, 1961 problems will include raising the price on albacore for European markets, development of markets, and expansion of exports to the United States. The industry feels that development of new markets for albacore is important, as well as markets for yellowfin tuna.

Japan's mothership-type tuna fishing fleets operating in the South Pacific in 1960

numbered five. In the era after World War II when the Japanese fishing vessels could not go beyond the "MacArthur Line," mothership-type tuna fishing came into being. At present 40-50 catchers are attached to one mothership and the mothership buys the tuna caught from the catchers. Of late, the fishing area is restricted to some specified areas because of the limited route supply and for the past few years the fishing operations have been confined to the area around the Fiji Islands, generally speaking. If the present conditions remain unchanged, the problems of resources and operational cost of the fleet will likely be brought up in the near future and for this reason, the industry asked the Japanese Fisheries Agency last year to permit small catchers to be carried aboard the mothership, but the request was denied. In some quarters it is said that if the mothership can carry small catchers on deck and reduce the number of regular catchers belonging to the fleet, the radius of operations will be larger and operations will be rationalized both from the standpoint of economy and operation. This will certainly be a problem for 1961.

Frozen tuna transshipped to the United States are taken care of at transshipping points located in Central and South America. Shipment to the United States is by freighters. The Japanese vessels in pelagic tuna fishing must have either their own tuna bases or establish packing plants. Some Japanese fishing companies are said to be planning to establish local packing companies and if they materialize, a way will be opened for export to the United States. (Fisheries Economic News, February 3, 1961.)

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TUNA VESSEL OWNERS SUBMIT COST ESTIMATES:

Vessel owners of tuna catcher boats (85 to 200 gross tons) fishing for tuna motherships recently submitted a petition to the Japanese Fishery Agency asking for an expansion of present fishing grounds and an increase in the catch quota. Vessel owners claim that present restrictions make it difficult to conduct profitable operations. In support of their claims, they submitted cost figures based on the No. 3 Tenyo Maru tuna mothership operations in 1960. That fleet landed a total of 6,426 metric tons valued at 335,856,000 yen (US\$932,933) at the mothership. Divided equally among the 45 vessels which worked with that fleet, each vessel received a gross of 7,450,000 yen (US\$20,695), which can be broken down as follows:

Japan (Contd.):

	Yen	US\$
Gross	7,450,000	20,695
Cost of operating vessel (fuel, food, etc.)	2,285,000	6,345
Net balance	5,165,000	14,350
Crew's share (40 percent of net balance). (25 shares--82,540 yen or US\$230 per share, equal to 33,000 yen or US\$90 a month)	2,066,000	5,740
Owner's share	3,099,000	8,610
Owner's expenses:		
Amortization	890,000	2,470
Fishing gear	157,000	435
Vessel equipment	50,000	140
Officer's share	272,000	755
Crew insurance	66,000	185
Vessel insurance	184,000	510
Taxes	50,000	140
Maintenance	500,000	1,390
Miscellaneous expenses	50,000	140
Total	2,219,000	6,165
Owner's profit	880,000	2,445

Vessel owners state that the above record was achieved by intense fishing and catching the full quota allotted the Tenyo Maru fleet, and contend that profits will likely be much less this year. (Suisan Keizai Shimbun, February 12, 1961.)

COLORED CELLOPHANE PREVENTS RANCIDITY IN FROZEN FISHERY PRODUCTS:

Studies by the Japanese have established that colored cellophane packaging prevents rancidity in frozen fishery products during storage. Fish products are apt to lose quality through auto-oxidation of their oil content. Numerous investigators have reported on the auto-oxidation of oil accelerated by heat, light, moisture, heavy metals, etc. Ultraviolet light produces the most acceleration, followed by violet and blue light.

Some chemical characteristics of specimens of methyl oleate, skipjack-head oil, and lard kept wrapped with different commercial colored cellophanes were studied. It was concluded that deep-orange cellophane capable of absorbing all light waves shorter than 540 millimicron gives excellent protection to these specimens against sunlight. In wrapping fish products, orange cellophane seems to be superior to green as far as the external appearance of the products is concerned. The wide use of orange cellophane for wrapping frozen fishery products is recommended by the researchers. (Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, no. 3, 1959.)

EXPORT MARKET FORECAST FOR FISHERY PRODUCTS, 1961:

The Japan Export Trade Promotion Agency has made the following forecast on export market conditions for fishery products in 1961.

Canned Fish Export Market: Demand for canned tuna has increased in Europe and the United States import quota for canned tuna in brine for the lower tariff rate is higher this year. These developments point to an increase in canned tuna exports; 1961 exports should total about 3.7 million cases.

Exports of canned salmon should be about 1.5 million cases, about the same as in 1960; exports of canned crab should be about 600,000 cases.

Exports of canned saury should total about 300,000 to 350,000 cases if fishing conditions improve. In 1960, saury landings declined drastically and canned saury stocks are presently depleted.

Frozen Tuna Export Market: Exports of frozen tuna to Europe showed a tremendous increase in 1960 due to more vessels participating in the Atlantic tuna fishery, and prices dropped in mid-season. This year demand in Europe, primarily Italy, is expected to be about the same as last year, with better control being exercised over deliveries.

Whale Oil Market: Production of whale oil is expected to increase with the addition of one more whaling fleet this year. However, domestic demand is expected to increase and so exports of whale oil are expected to be at about the same level as in 1960. (Nippon Suisan Shimbun, January 30, 1961.)

FISHING COMPANY BUILDS COLD-STORAGE PLANT IN CANARY ISLANDS:

A large Japanese fishing company expects to complete the construction of a 3,000-ton capacity cold-storage plant in Las Palmas, Canary Islands, by this summer. This plant is being constructed jointly by the Japanese firm and an Italian firm.

The Japanese firm has been utilizing Las Palmas as a base of operations for its Atlantic trawl fleet, which this year totals eight vessels. Construction of the freezing plant will facilitate the shipment of catches made by these trawlers, which previously returned directly to Japan with full loads or transship-

Japan (Contd.):

ped their catches to Japan via commercial vessels.

The same Japanese firm has opened up a field office at Monrovia, Liberia. Eventually the firm hopes to establish Monrovia as a fishing base for its tuna fleet operating in the Atlantic Ocean. (Nippon Suisan Shimbun, February 27, 1961.)

FISHING COMPANY PLANS FISH-SAUSAGE AND COLD-STORAGE PLANTS:

A Japanese fishing company is planning to build a fish ham-sausage plant, a freezing plant, and a refrigeration plant in the city of Yamato, Kanagawa Prefecture. Construction was due to begin in February 1961.

The company that is building the plants is one of the larger fishing companies in Japan. According to the 1960 Yearbook of Fisheries, tuna sales made up to 70 percent of the company's total sales and company-owned vessels at the end of 1959 totaled 14. Six of those 14 vessels (one each of 1,250, 700, 550, 409, 409, and 320 gross tons) operated out of Italy.

The company operates one salmon mothership (Nichian Maru) and a freezership (Otsu Maru, 8,000-ton class), and also operates a number of trawlers in the East China Sea trawl fishery.

The firm also owns a two-line cannery (daily capacity of 600 cases) at Kesennuma, Miyagi Prefecture, in northeastern Japan. (Nippon Suisan Shimbun, January 23, 1961; 1960 Yearbook of Fisheries, January 1960.)

FISHING VESSEL CONSTRUCTION TRENDS:

In January 1961 the Japanese Fishery Agency approved the construction of 140 fishing vessels. They include 18 tuna long-line vessels (ranging from 99 to 389 gross tons) and 7 smaller tuna long-line vessels (each of 39 gross tons).

Other vessels approved for construction are a freezer-carrier vessel of 5,000 gross tons for a large fishing company and a carrier vessel of 1,480 gross tons for another fishing company.

Still another large Japanese fishing company is constructing a 10,000-ton class vessel in Hiroshima at a cost of 1.5 billion yen (US\$4.2 million). The vessel is scheduled to be completed in April and is to be sent to the Olyutorski area to serve as a mothership for the bottomfish long-line fishery. About 30 catcher boats in the 75-ton class shall be assigned to her, of which 10 will be crab tangle-net vessels. The mothership later will be used as a freezer vessel for Antarctic whaling. (Shin Suisan Shimbun, January 30, 1961; Shin Suisan Shimbun Sokuho, January 12, 13, 21, 31, 1961.)

GOVERNMENT PLANS TO IMPORT FISH MEAL:

The Japanese Fishery Agency and Bureau of Animal Husbandry have held different views on fish meal imports. Fishery Agency and domestic fish meal producers (whose views the Agency supports) are now greatly concerned over the recent development where funds have been appropriated in the Ministry of Agriculture and Forestry's budget for next fiscal year to pay for fish meal imports. This move was primarily instigated by the Bureau of Animal Husbandry, and the Fishery Agency until recently was completely unaware of this development. The sum of 1,207,600,000 yen (US\$3,354,444) has been allotted in the next fiscal year's budget to cover the cost of importing 32,000 metric tons of fish meal.

However, for the Government to import fish meal as proposed in the budget, fish meal must first be covered under the Feed Stabilization Law. Despite the Fishery Agency's objection, it seems to be a matter of time only before the proposal to include fish meal in the Feed Stabilization Law will be approved.

According to the Bureau of Animal Husbandry, the purpose of subsidizing the import of fish meal is to promote the orderly importation of fish meal and help stabilize the demand for fish meal as an animal feed product. On the basis of this fiscal year's (ends March 31, 1961) import of foreign fish meal, which is expected to total 30,000 tons, the Japanese Government hopes to import 32,000 tons next fiscal year beginning April 1, 1961. However, should saury fishing improve over last year's disastrous season and production of saury fish meal increase accordingly, Bureau of Animal Husbandry claims that the Government will then give this matter careful

Japan (Contd.):

consideration and will not necessarily import 32,000 tons of foreign fish meal as provided for in the budget.

Bureau of Animal Husbandry states that the Bureau shall consult the Fishery Agency on ways and means of importing fish meal even under the proposed new set-up, and is presently pushing plans to incorporate fish meal in the Feed Stabilization Law.

Concerning this fiscal year's imports, the Animal Husbandry Bureau has continued to negotiate with the Fishery Agency on importing an additional 10,000 tons of fish meal in view of shortages in supply expected in March and April. Earlier a quota of 20,000 tons had been approved for import, of which 18,000 tons have already been consumed. The Fishery Agency approved the Bureau's proposal to import the additional 10,000 tons of fish meal under the condition that discussions would be held between the Animal Husbandry Bureau and the Fishery Agency on the disposition of savings resulting from importing meal, and that users shall pay no less than 46,000 yen (US\$127.78) per metric ton for domestic saury fish meal even if the price of this product should decline below the 46,000-yen level. (*Nippon Suisan Shimbun*, January 23 and 30, 1961.)

INDUSTRY PROTESTS PLAN TO IMPORT FISH MEAL:

The disclosure that an allocation of approximately 1.2 billion yen (US\$3,355,555) had been made in Japan's budget for the fiscal year beginning April 1, 1961, for importing 32,000 metric tons of fish meal (a move engineered by the Livestock Bureau, Ministry of Agriculture and Forestry) has created a tempest in the Japanese fish meal industry.

Immediately following this disclosure, the Secretary of the Livestock Bureau made the following public announcement: "In view of existing shortages in fish meal supply, it was only logical that funds should be budgeted for importing fish meal to stabilize prices. If the Fishery Agency can arrange for an adequate supply of fish meal, then the funds will not be used for the purpose that they were budgeted for.

"A public proclamation must be made concerning the inclusion of fish meal as an item covered under the Feed Supply Stabilization Law. For this purpose, the Committee on Supply Stabilization shall meet in March or April to discuss this matter. Fishing industry representatives shall be appointed to this committee so that their full views can be heard.

"Price differentials ('profits') realized from importing fish meal shall be used to plug deficits in the Food Control Fund. However, the Livestock Bureau shall consult with the Fishery Agency on the disposition of 'profits' expected from the sale of 10,000 tons of fish meal to be imported this year. No such agreement had been made between the Bureau and Agency on the 70 million yen (US\$194,444) realized from the earlier import of 20,000 tons of fish meal. This money shall perhaps be utilized for studies on animal feed."

Concerning the recent trend where fishing companies have begun to enter the livestock-raising business, the Secretary stated that such investments in an enterprise of national economic importance were desirable, but care should be exercised to prevent confusion within the livestock industry. Perhaps some controls should be instituted at the present time, for it is feared that the big fishing companies would overwhelm the smaller farmers and create apprehension in related industries.

In reply to the Secretary's statement, fish meal producers, led by the National Federation of Fishing Cooperative Associations, retorted that the Livestock Bureau had acted arbitrarily, and claimed that fish meal imports should not be covered under the Food Control budget for it is not a foodstuff and fish meal should be imported as animal feed. If foreign fish meal is to be listed as a special product under the Animal Feed Supply Stabilization Law, then it would be logical to place fish scrap and domestic fish meal under this law also. The Federation further stated that Government involvement in the purchase of foreign fish meal would mean that "profits" would only be used to plug deficits in the Government (Food Control) budget and would not result in any future benefits to the fish meal industry. At the same time, Government participation would tend to stifle the freedom of fish meal and livestock producers. (*Suisan Keizai Shimbun*, February 4, 1961; *Suisan Tsushin*, February 6, 1961.)

Japan (Contd.):

IMPORT PRICE FOR PERUVIAN FISH MEAL:

According to recent available information the 10,000 metric tons of Peruvian fish meal to be imported by Japan in the near future will likely be imported at a price of \$95.50 c. & f. per metric ton. (Nippon Suisan Shim-bun, February 8, 1961.)

GROUND FISH MOTHERSHIP FIRMS PLAN UNIFORM CHARTER RATES FOR CATCHER VESSELS:

In preparation for the departure of the groundfish mothership fleet for North Pacific waters in May, the large Japanese fishing companies are planning to adopt uniform charter rates for catcher vessels to be assigned to their mothership fleets. In the past, each mothership company conducted separate negotiations with individual catcher-boat owners, fixing rates according to vessel capacity based on an evaluation of size, motor power, and kind of vessel. This has resulted in large differences in sums paid by companies for chartering catcher vessels. Companies often vied with one another in chartering vessels, which resulted in higher charter rates. The mothership companies hope to eliminate this wasteful competition by establishing a uniform rate.

The uniform charter fee shall cover repairs, equipment, increases, if any, in insurance rates, and cost of restoring vessels to their original condition at the end of the charter. Different rates are expected to be paid depending on the objective for which a vessel is chartered, for example for dragging or for long-lining. Higher rates are expected to be paid for the charter of vessels which normally engage in some other fishery during the charter period; lower rates for vessels chartered during their off-season periods.

The charter rate for one month for a 75-gross ton bottom trawler from the East China Sea fishery is expected to average about 750,000 yen (US\$2,083); that for a 70-gross ton long-line vessel about 700,000 yen (US\$1,944), the rates paid in 1960. (Suisan Keizai Shim-bun, February 3, 1961.)

HERRING IMPORTED FROM U. S. S. R.:

The Hokkaido Federation of Fisheries Cooperatives in Japan imported some herring from the Soviet Union in May 1960. This year it was decided to repeat the order. Negotiations on price were going on as of February 9. According to well-informed sources, the price will be agreed at \$85-\$90 per metric ton and the quantity is expected to be 1,000 tons. Five trading firms will handle the imports and points in the negotiations are:

(1) The Federation wants to pay \$80 while the Soviet side is asking for \$95 a ton for the herring.

(2) Japan last year sent a carrier of the 200-ton class to pick up the herring. This year 3 or 4 larger carriers will be used.

(3) Since the quota was increased to US\$100,000, some 1,000 tons may be imported. (Fisheries Economic News, February 9, 1961.)

VALUE OF FISHERIES INCREASES 13 PERCENT FROM 1958 TO 1959:

Japan's fisheries landings in 1959 totaled 5,880,000 metric tons (excluding whaling activities), 7 percent greater than for 1958 and 20 percent higher than for 1955. The fish catch in the inland waters remained roughly at the same level as for the previous year, but other areas showed an increase. Japan's catch of 19,490 whales in 1959 was 757 whales greater than for the previous year. Considering the fishing industry as a whole, Japan's fishery landings (excluding whales) valued at \$773 million and the whale catch valued at \$61 million were each roughly 13 percent higher than for 1958.

In number and tonnage of fishing vessels, Japan had at the end of 1959 some 400,477 vessels with a gross tonnage of 1,672,546 tons (average tonnage per vessel of 4.18) engaged in fishing activities. Nearly all of the vessels were engaged in coastal or open-sea fishing activities; only a small percentage was in shallow inland water fishing activities (21,124 vessels with 12,874 gross tons). During 1959, there was little change in the total number of vessels or in the gross tonnage of those vessels, but progress was made in the modernization of the fleet. There was an increase of roughly ten percent in powered fish-

Japan (Contd.):

ing crafts and roughly the same percentage reduction in nonpowered crafts. Moreover, there was an increase in steel vessels in contrast to a reduction in tonnage of wooden vessels during the year. (United States Embassy, Tokyo, February 8, 1961.)



Mexico

FISHERY COOPERATIVES
AIDED BY GRANTS:

According to a Mexico City newspaper of February 12, 1961, the Government is granting financial and technical assistance to various fishery cooperatives in the Campeche and Salina Cruz areas. This is the result of an inspection trip by the Minister of Industry and Commerce and the Director of the Cooperative Development Bank.

The Director of the Bank has announced that a credit of 300,000 pesos (about US\$24,000) had been granted Campeche cooperatives to purchase five vessels for scale fish; Campeche octopus fishermen were granted 600,000 pesos (about US\$48,000) for repair of vessels and liquidation of debts; Ciudad del Carmen cooperatives were given 450,000 pesos (about US\$36,000); and Salina Cruz cooperatives 1,800,000 pesos (about US\$144,000) to buy three shrimp trawlers.

Under study are requests from cooperatives: (1) In Salina Cruz to purchase 14 shrimp trawlers and a shrimp-freezing plant; (2) In Ciudad del Carmen to buy 7 shrimp trawlers; and (3) In Campeche to buy 5 marine motors and to recondition gear and equipment.

It was also announced that the Cooperative Development Bank was instituting a technical assistance program for fishery cooperatives which would consist of three aspects.

(1) Offer services of auditing, management, or bookkeeping and place biologists at the disposition of the cooperatives. The costs are to be covered by the trust fund when the cooperatives cannot afford them.

(2) Authorize a fishery technicians scholarship from each fishing zone to cooperative members to study at the Naval School of Ma-

rine Biology in Veracruz. For the present cooperatives of Ciudad del Carmen, Salina Cruz, Campeche, Guaymas, and Mazatlan have been invited to designate fellows.

(3) The first two fishery technicians to finish this year shall be employed as advisers by the Cooperative Development Bank.

The above assistance is not obligatory but will be granted those fishery cooperatives that request it, the United States Embassy in Mexico City reported on February 16, 1961.



Morocco

FISHERY LANDINGS AND EXPORTS, 1960:

Earlier in 1960 it was expected that the sardine catch, the mainstay of the Moroccan fishing industry, would be very large. This was the case in Safi where the 1960 catch was estimated at 75,000 metric tons. The previous record for the port had been 61,000 tons. The catch in Agadir, which normally supplies about half the sardines of Morocco, however, was very disappointing. The industry there has not been able to recover from the disastrous earthquake of February 1960.

Preliminary but official figures set the total fish and shellfish catch in Morocco for 1960 at 106,699 tons, of which 90,000 tons were sardines. This compares to a catch of 137,500 tons in 1959 of which 103,880 tons were sardines.

Exports of canned fish in 1960 continued to be better than for the preceding two years. In spite of the poor landings at Agadir, exports of canned sardines from Agadir from the beginning of the season in June to the end of October 1960 were almost double those in the same period in 1959.

Exports of fishery products increased steadily in both quantity and value from 1958 to 1960. Most of the increase was due to a better market for canned sardines. Over the 3-year period fish meal exports declined sharply both in price and volume. Canned tuna exports declined in 1960 as compared with 1959; however, the exports of other canned fish improved, primarily due to increased canned mackerel exports.

In October 1960, the exports of all canned fish totaled 5,555 tons, almost twice

Morocco (Contd.):

Moroccan Fishery Products Exports, January-October 1958-1960								
	Quantity			Value				
	1960	1959	1958	1960	1959	1958	1960	1959
 (Metric Tons) (Dirhams 1,000) (US\$1,000)	
Fresh fish	16,709	16,368	13,677	26,951	21,413	19,907	5,326	4,232
Fish meal	10,321	13,815	17,473	4,746	7,782	8,641	938	1,538
Fish oil	3,877	2,958	3,087	2,316	1,739	2,225	458	344
Canned fish:								
Sardines	26,232	23,773	21,707	72,810	55,173	50,275	14,389	10,904
Tuna	2,165	2,865	2,704	7,670	8,724	8,884	1,516	1,734
Others	4,134	2,991	1,663	6,440	3,029	1,563	1,273	599
Totals	63,438	62,770	60,311	120,933	97,860	91,495	23,900	19,341

the tonnage of any month in the past few years. Efforts continued in the Casablanca region to increase the consumption of fresh sardines. Wholesale prices for sardines in Casablanca averaged about 12 U. S. cents a pound in 1960. (United States Embassy, Rabat, January 25, 1961.)



Netherlands

WHALING COMPANY REPORTS THAT 1959/60 SEASON WAS BEST IN 14 YEARS:

The management of the Netherlands Whaling Company reports that the 1959/1960 season was very favorable. For the first time in its 14-year existence the company can make a repayment amounting to fl. 149,442 (US\$39,608) against the Government subsidy, thus leaving a balance of fl. 34,222,872 (\$9,070,460) in government subsidies to be repaid. During the 1958/1959 season the Government was obliged to pay the company fl. 1.9 million (\$503,500) in order to enable the company to pay the guaranteed dividend of six percent.

The total value of the entire 1959/1960 season's production amounted to fl. 22 million (\$5,830,900) compared to fl. 18 million (\$4,770,730) during the 1958/1959 season. Operation costs rose from fl. 11.8 million to fl. 14.4 million (\$3,127,480 to \$3,816,590). General expenditures amounted to fl. 778,823 (\$206,420) leaving a gross profit of fl. 7 million (\$1,855,290), a 30 percent increase over the fl. 5.4 million (\$1,431,220) for the 1958/1959 season. After depreciation, taxes, and interest net profits amounted to fl. 1,063,138.46 (\$281,775).

The whale oil was sold at an average price of fl. 766.61 (\$203.18) per metric ton, as com-

pared to fl. 769.23 (\$203.88) during the preceding year. Sperm oil brought an average price of fl. 569.17 (\$150.85) (fl. 591.65 or \$156.81 during the preceding year), fish meal fl. 523.70 (\$138.80) (fl. 597.43 or \$158.34 during the preceding year), and whale meat fl. 792.91 (\$210.15) per ton.

Production of the Netherlands' Whaling Company's Whaler, the Willem Barendsz, 1958/59 and 1959/60		
Product	1959/60 Season	1958/59 Season
 (Metric Tons)	
Whale oil	23,399	18,663
Sperm oil	344	2,295
Vitamin oil	11	12
Whale meal	5,022	3,698
Whale meat	1,726	-
Whale bones	63	38

The management observes that a total of 21 expeditions are operating in the Antarctic in the 1960/61 season, namely 8 from Norway, 2 from Great Britain (last year 3), 7 from Japan (last year 6), 3 from the U. S. S. R. (last year 2), and 1 from the Netherlands. The changes are reportedly due to the sale of an English whaling fleet to Japan and the addition of a new Russian whaling fleet.

The management further reports that the Willem Barendsz started the catch for the current season on November 28, 1960. The fleet consists of the Willem Barendsz and 14 catchers. As a result of the satisfactory production and sale of frozen whale meat the company decided to enlarge the freezing capacity on board the Willem Barendsz from 1,700 tons to about 2,500 tons. The sale of the frozen meat is reportedly assured up to and including the 1962/1963 season, while frozen whale liver can be included under the contract for the frozen whale meat. As a result of the sale of frozen liver there will be no vitamin oil available in the present catch.

The company reports that it has concluded an agreement with a Japanese fishing compa-

Netherlands (Contd.):

ny to process and freeze whale meat from the Willem Barendsz and deliver it to Europe where it has already been sold. (United States Consulate in Amsterdam, February 8, 1961.)

ANTARCTIC WHALING PRODUCTION TRENDS, FEBRUARY 14, 1961:

The 1960/61 Antarctic whaling season's catch as of February 15 by the Netherlands Whaling Company was about equal to that of February 14, 1960, in the 1959/60 season, the shareholders were told at a general meeting held on February 20, 1961.



The firm's directors called the figures "not bad," but said there was "no cause of jubilation," since the catch which began on November 28, 1960, started 18 days earlier than in the previous season. As the season was only half over, the directors refrained from predictions as to the final results.

Production for 1960/61 on February 15 was whale oil 10,401 metric tons as compared with 11,571 tons on February 14 last year; sperm oil output rose from 320 to 1,289 tons; meat meal fell from 2,306 to 1,950 tons; but frozen meat was up from 825 to 1,009 tons. A Japanese refrigerated vessel, which under an agreement is taking over whale meat from the Dutch company's factory-ship, produced an additional 5,187 tons of frozen whale meat. (Foreign Agricultural Service Report, February 20, 1961.)



Nicaragua

SHRIMP LANDINGS ON CARIBBEAN COAST MAY BE INCREASED BY NEW PLANTS:

The Nicaraguan fishing industry is centered on the Caribbean coast. The fishing

industry is mainly concerned with the shrimp and spiny lobster fisheries, though small quantities of food fish are also caught incidentally. Food fish are consumed locally, but almost all of the shrimp and spiny lobster landings are exported frozen to the United States. It is estimated that over 500,000 pounds of heads-off shrimp were exported in 1960, and a much smaller quantity of spiny lobsters. With a combination of more vessels in operation and better shore facilities, the landings in 1961 should increase.

By far the largest fishing company operating in Nicaragua is a French-owned firm, which presently has over 20 active shrimp vessels. This company's land-based installations are located in El Bluff and are valued at over US\$1 million. In addition to this firm, there is one company building shore facilities on Corn Island, off the coast from Bluefields, and another company plans to begin construction in the near future on the same island, though both of these plants will be small. A limited amount of spiny lobster and shrimp fishing is also carried on by local fishermen using small boats, which usually sell their catch on the local market or to one of the companies with freezing facilities for export.

Although foreign companies exploit tuna grounds 20 miles and more off the Nicaraguan Pacific coast, the only commercial fishing is small-scale operations carried on by the few charter sport-fishing vessels in the area when they do not have clients. This fishing is exclusively for local consumption. (United States Embassy, Managua, February 13, 1961.)



Norway

ANTARCTIC WHALING TRENDS:

The Norwegian Antarctic whaling expeditions had poor results in the first part of the 1960/61 season. Preliminary figures for the first 11 days (December 28, 1960-January 7, 1961) show a total production of 69,390 barrels of whale oil as compared with 93,656 barrels produced in the first 13 days of the 1959/60 season. Average daily production during the first part of this season was down 1,000 barrels from the same period of the 1959/60 season. Poor weather conditions were held responsible for the lower production at the beginning of the season.

A later report showed some improvement during the first 25 days of the 1960/61 season

Norway (Contd.):

the production totaled 198,500 barrels of whale oil as compared with 193,900 barrels for the first 27 days of the 1959/60 season. But in comparing the two seasons, it should be noted that Norwegians are using 81 catcher boats this season--11 more than last year.

During the 1959/60 Antarctic whaling season Norwegian expeditions produced only 4,515 blue-whale units of their national quota of 5,800 blue-whale units. The quota was based on the actual annual production prior to the 1959/60 season.

In protest against the recent decision of the Norwegian Government to remain in the International Whaling Convention, the whaling industry has withdrawn its representative from the Norwegian Whaling Council. As a consequence, there will be no Norwegian industry representative in the Norwegian Delegation to the London whaling quota talks. (United States Embassy, Oslo, February 17, 1961)

AID FOR FISHERMEN APPROVED:

On February 2, 1961, the Norwegian Storting approved an appropriation of 59.7 million kroner (US\$8,358,000) for aid to fishermen in 1961. The appropriation will be used: (1) 22 million and 11.5 million kroner (\$3,080,000 and \$1,610,000) to support herring and cod ex-vessel prices, respectively; (2) 23.5 million kroner (US\$3,290,000) to assist in defraying the costs of nets and bait; and (3) 2.7 million kroner (US\$378,000) for miscellaneous purposes. The total appropriation for aid to fishermen is larger than for 1959, but cod fishermen will receive somewhat less in 1961.

Herring ex-vessel prices will be supported for the first time from appropriated funds in 1961. Prior to this year herring prices have been maintained by payments into or withdrawals from the industry's Herring Price Equalization Fund. Due to the sharp drop in herring meal prices, withdrawals have just about depleted the Fund.

FIRST STERN TRAWLER LAUNCHED:

Norway is another of the several fishery nations to join the trend to stern trawlers.

The first stern trawler (Hekktind), built for a firm in Melbu, North Norway, was launched early this year at Bergen. (News of Norway, February 2, 1961.)

FISH CANNERS FORM EXPORT POOL:

A large Norwegian firm in Stavanger, a pioneer in the business of canning sardines, has joined two major fish canneries in Bergen in establishing a joint export organization with an office in Bergen. The export firm will take care of exporting sardines (brisling and sild) and kippers to the European Free Trade Association (EFTA) nations, plus continental and other special markets.

Last year, the three participants canned about half of the brisling, sild, and kippers produced in Norway.

The joint export organization was primarily launched to take advantage of the opportunities that will open up as tariffs among the Outer Seven are reduced. The cost of sales promotion in the foreign markets will be divided among the participants in the new firm according to their share. (News of Norway, January 26, 1961.)

FISHERIES TRENDS, 1960:

Norwegian fishery landings in 1960 totaled about 1,307,000 metric tons or some 679,000 tons below the record set in 1956 and 120,000 tons below the annual average landings for the years 1946-59. The decline in the landings since 1956 has been due almost entirely to the greatly diminishing herring catches. The "ex-vessel" value of the 1960 catch amounted to 641.7 million kroner (US\$89.8 million) or 25 million kroner (\$3.5 million) below the 1959 level. The value of exports of fish and fish products went down from about 950 million kroner (\$133.5 million) in 1959 to approximately 900 million kroner (\$126.0 million) in 1960. Exports of frozen fillets increased by 5,000 tons to nearly 26,000 tons in 1960, however.

The Prime Minister has announced that a proposal soon will be placed before the Storting to expand the Norwegian fishing boundary to 6 miles effective April 1, 1961, and to 12 miles effective September 1, 1961. He added, however, that before taking action Norway would negotiate agreements on fishing rights with those nations whose fishermen have tra-

Norway (Contd.):

ditionally fished within the new boundaries. An agreement with the United Kingdom has already been completed and negotiations with West Germany are under way. According to the press, Norway has had no approach from the U. S. S. R. in connection with the impending expansion of the fishing boundaries. This is presumably because the Soviets have themselves proclaimed a 12-mile fishing and territorial boundary. (United States Embassy, Oslo, January 26, 1961.)

PRODUCERS SEEK TO BARTER DRIED-SALT FISH FOR CUBAN SUGAR:

The Norwegian press reports that a representative of a private Norwegian firm went to Cuba to negotiate a barter deal involving dried-salt fish (klipfish) and Cuban sugar. The Norwegian firm proposes to barter klipfish valued at 10 million kroner (US\$1.4 million) for 20,000 metric tons of sugar. The Norwegian Government has authorized the negotiations.

The initiative for the proposed barter deal came from the klipfish exporters who hold large stocks of the product. In the past two years exports of klipfish to Cuba have averaged 12 million kroner (\$1,680,000) in value.

WINTER HERRING FISHERY PROSPECTS UNCERTAIN:

The annual winter herring fishery off the west coast of Norway barely got under way the week of February 12, far behind schedule. On February 16, fishermen had landed a total of less than 240 metric tons, as compared with some 90,000 tons on the same date in 1960, described as a catastrophic herring year.

The outlook for Norway's annual herring fishery towards the latter part of January 1961 appeared very uncertain. By that time, huge shoals should have been reported on the spawning banks off the Norwegian west coast. But not a single shoal had been spotted by ocean research vessels and scout planters probing the Norwegian Sea. And marine biologists said frankly that they did not believe the herring would show up for several weeks yet. This would cut the season, normally running 10-11 weeks, to a mere 6-7 weeks.

Meanwhile, fishing vessels from many coastal districts had assembled in the port of Aalesund to await the annual herring influx. Only about 300 purse-seiners will take part this year, as compared with 450 last year and some 600 in 1959. The reason for the reduced participation is that purse-seining for herring has become less and less profitable in recent years. In 1960, only one-fourth of the purse-seiners managed to catch enough herring to show a profit. The rest finished the season deep in debt for gear and provisions. In the period 1957-1960, the purse-seine fleet as a whole suffered a net capital loss of Kr. 115 million (US\$16.1 million). Crew members, working on shares, are somewhat better off. In case of an operating loss, the State has guaranteed each man a minimum share of Kr. 125 (\$17.50) per working week. (Proceeds from the catch are prorated, with 25 percent going to the fishing vessel's owner; 25 percent to the owner of the nets; 5 percent to the captain; 5 percent to the master seiner; and 40 percent in equal shares to the crew.)

Herring meal and oil processing plants, which buy two-fifths of the total catch, are feeling the pinch of South American competition, especially in Peru. In the opinion of the Fisheries Minister, the enormous expansion of Peru's fish meal industry represents a greater problem than the diminishing herring catch. In a recent address, he said radical changes were required to assure the future. In the first place, he suggested, the herring fleet should be used in the North Sea and other deep ocean fisheries. Secondly, much more herring should be salted and filleted for human consumption. "We have depended too much on industrial utilization," he declared.

The winter herring fishery, most important of Norway's herring fisheries, produced 3.2 million hectoliters (about 297,600 metric tons) last year, the worst catch since 1934. In 1959, also a poor year, the total catch was 4.5 million hectoliters (about 418,500 tons), whereas the annual average for 1954-58 was over 9 million hectoliters (approximately 837,000 metric tons).

Scientists at the Oceanographic Research Institute in Bergen, operated by the Directorate of Fisheries, take a dim view of prospects facing Norway's herring fisheries, at least for the next several years. Their dire prognostications are based on comprehensive age studies which show that herring spawned in 1950, the last big spawning year, accounted for the large catches in 1954-57. And the 1950

Norway (Contd.):



A large purse seine has been set around a submerged school of herring. The seine has been pursed and the net is being dried into the mechanized purse seine dories for confining the fish more closely in the bag of the net.

herring, now in their 11th year, are still far more plentiful than those spawned in subsequent years. These and other significant findings indicate that the stock of mature herring spawning on the banks off Norway will continue to diminish for 2-3 years. (*News of Norway*, January 26 and February 23, 1961.)



Peru

EXPORT PRICES FOR FISH MEAL, JANUARY 1961:

The Peruvian National Fisheries Society (the trade organization for the fisheries industry) reported that the average export price for fish meal (65-67 percent protein)

during January 1961 was US\$71.50 a metric ton (US\$64.86 a short ton), an increase of about 17.2 percent over the December 1960 average of \$55.34 a short ton. (United States Embassy in Lima, February 16, 1961.)



Portugal

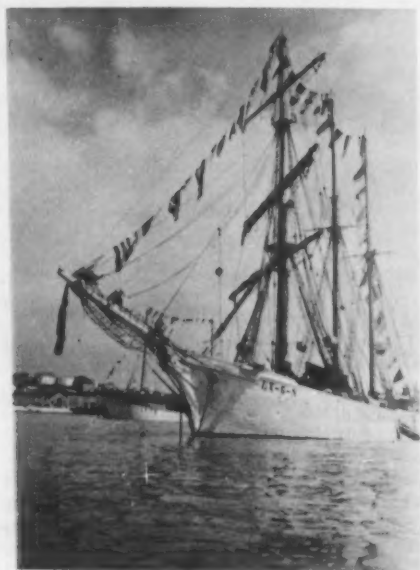
FISHERIES TRENDS, 1960:

Although no recent official estimates of the 1960 cod catch were available early in 1961, it appears that 1960 was an excellent year for Portuguese fisheries. Statistics for the first nine months indicated that the sardine catch may even exceed that of the record 1958 catch, and the domestic demand for sardines held

Portugal (Contd.):

prices at a satisfactory level, even though exports of canned sardines during January-November 1960 were down about 14 percent from 1959. Trawl fishing, on the basis of figures available through August 1960, seemed to be running at a satisfactory level comparable to 1959, but with somewhat improved prices.

Most of the cod fleet returned during October 15-November 15, 1960, and at that time the catch for the 1960/61 season was estimated at 64,000 metric tons of wet-salted cod. Some trawlers had returned to the Banks for a second trip and did not reach Portugal until December. The catch was not regarded as outstanding, though a great improvement over the 1958/59 and 1959/60 seasons.



One of the oldest Portuguese cod line-fishing vessels "decked out" for blessing.

The supply of dried cod for consumers has been tight, but ceiling prices have not been changed. During the Christmas season about 3,000 tons were put on the market, of which about 720 tons were imported from Norway. Some small quantities of the 1960/61 catch had already been processed and sold early in 1961.

In January this year some trawlers were already starting for the Grand Banks for the

1961/62 season in which 26 or 27 trawlers and 47 hook-and-line vessels manned by some 5,000 fishermen are expected to participate, or about the same fleet as last season's. The hook-and-line vessels were not expected to leave until later this year.

A decree of November 24, 1960, established a new Guild of Tuna Fishing Shipowners (Gremio dos Armadores da Pesca do Atum). The guild should assist the tuna-fishing industry in the improvement of fishing facilities, and in particular with its relationships with the Government. The establishment of such a guild has been discussed for several years, and is commensurate with the growing importance of this branch of the industry.

Lisbon's new fishing dock at Pedroucos has been leased for 25 years to Docapesca (Sociedade Concessionaria da Doca de Pesca, S.A.R.L.) which will install facilities such as compressed air, quick-freeze units, heating supply, laboratories, ovens, salt-water purifying apparatus, and other equipment. The dock and installations are expected to be fully operative in about two years. Docapesca resembles a local industry cooperative, as the majority of its shares are owned by the Municipality of Lisbon, the Sardine and Trawl Fishing Shipowners Guilds, and the Central Board of the "Casas dos Pescadores" (fishermen's union and welfare organization). The balance of the Docapesca shares are reserved for sale to fishermen, shipowners, and others associated with the industry.

There were two developments regarding agar-agar during the fourth quarter of 1960. On October 28, a ministerial order embargoed further exports of seaweed without prior authorization by the Regulatory Commission on Chemicals and Pharmaceuticals. The Commission is to authorize seaweed exports only in cases where it finds that exports are justified and will not be harmful to the country in any way. It appears that this measure was the aftermath of one or more attempts of a Lisbon firm to make unauthorized shipments of agar-bearing seaweed to Japan, in one instance via Amsterdam. The Portuguese Government restrictions on exports of agar-bearing seaweed are related to its sponsorship of the local agar-agar industry. One plant has been established for some years in Portugal, and in November operations by a second plant were authorized. This latter plant, located at Alverca, near Lisbon, expects to commence production of agar agar,

Portugal (Contd.):

alginate, and certain types of carrageen gums within about six months. (United States Embassy, Lisbon, January 27, 1961.)

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PLANT FOR FABRICATING ALUMINUM FISH CANS PLANNED:

A Canadian aluminum mining and fabricating company will, in collaboration with Portuguese canning interests, build and operate a plant in Portugal to produce aluminum fish cans. Text of the company press release of January 31, 1961, follows:

"As part of its continuing efforts to develop new markets, Aluminium Limited is collaborating with Portuguese canning interests to build and operate a plant in Portugal to produce aluminum fish cans, the Company reported today.

"Use of such cans, particularly for sardine-type packs, has been pioneered by Aluminium Limited's affiliates in Norway over many years. Practically all Norwegian export of kippered herring and most sardines are now packed in aluminum.

"Introduction of aluminum technique to Portugal, where sardine production is a major industry, will be based on the Norwegian experience. Initially the new canning plant will use specially anodized and lacquer-sealed aluminum strip produced by Aluminium Limited's affiliates in Norway or England.

"The new can-making company, in which two of the principal Portuguese fish canners are participants, is called Fabrica de Embalagens de Alumínio Limitada. Its plant will be in production later this year at Matosinhos, the main centre of the fish-canning industry. Capacity of the plant is expected to reach 12 million cans per year during the introductory phase.

"Aluminum cans provide considerable savings in shipping expenses as compared to heavier cans, the Company said. The Portuguese sardines will be marketed mainly in the United States where aluminum fish cans are enjoying increasing popularity because of their ease of opening, attractive appearance, and resistance to corrosion." (United States Consulate, Montreal, February 2, 1961.)

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Senegal

TUNA LANDINGS POOR AT MID-SEASON:

As the 1960/61 tuna season (Nov. 15, 1960-April 30, 1961 for the majority of the fleet) passed the halfway mark, the total catch amounted to scarcely 5,000 metric tons (2,000 tons for export, 3,000 tons for the French quota), far short of what it should be if 1961 goals are to be attained (13,500 tons canned, a minimum of about 10,000 tons frozen).

This reveals what has been a disappointing season, which in turn has highlighted for the first time what seems to be the most important shortcoming of Dakar as a prospective tuna center, its location. The problem centers on the fact that Dakar rests at the extremity of the real fishing grounds, which range roughly from the Gabonese coast to the coast of Sierra Leone. Really good fishing off the coast of Senegal occurs only in a seasonal pattern. This was never regarded as a very serious matter, for the tuna had in the past always been plentiful. However, this year a combination of cold weather and unfavorable ocean currents has limited severely the size of the catch, and has caused the clippers to travel as far as Abidjan, Ivory Coast (at least ten days round trip in the small French boats) to find favorable fishing grounds.

Proponents of Dakar's being a tuna center claim that the trouble lies in the type of fishing fleet France sends to fish tuna. For the most part it is made up of small vessels of 15 tons capacity. These proponents argue that with more efficient, larger vessels this occasional off-season necessity of travel to richer waters would not be very important and would obviate subsequent much higher freight rates from more distant ports for the finished product. Besides, they argue, Dakar's cooler and more favorable climate, its harbor facilities, freezing plant, and already existing canneries make it the more favorable port. Also, apparently the richest bait grounds lie between Sierra Leone and Dakar. So Dakar-based ships can catch bait simply en route to the fishing grounds.

However, opponents argue that all this simply obscures the point that if the fishing grounds are in the Abidjan vicinity, why go clear back up to Dakar every few days to land the catch. These feel that as soon as Abidjan (or any other suitable port on the Gulf of Guinea) is developed and capable of freezing and canning tuna, the importance of Dakar will diminish considerably.

Senegal (Contd.):

Meanwhile, the Government of Senegal continues to grapple with its problem of fisheries expansion. It attempted to locate the fish for the fishermen by airplane, but was unsuccessful. (United States Embassy, Dakar, February 13, 1961.)



South Africa*

MOST OF 1961 FISH MEAL AND OIL PRODUCTION SOLD IN ADVANCE:

The South and South-West African fishing industry, which in 1960 sold its entire record production of 148,000 short tons, has already found buyers for 60 percent of its anticipated 1961 production. The 1961 production of fish-body oil has also been sold in advance, and the South African Fish Oil Producers' Association has made arrangements to charter the tanker Anella to carry the oil to overseas markets.

According to the Chairman of the South African Fish Meal Producers' Association, who has spent much of 1960 traveling to the markets for South African fish products, East Germany has become one of the large buyers of South and South-West African meal. In 1959 it purchased 11,000 metric tons through a London import house, and it has now bought £1 million (US\$2.8 million) worth direct from the Association.

In a period of market disruption, caused by the massive entry of Peru as the world's largest meal producer, the South and South-west African industry has gained from its co-ordinated and highly efficient marketing system in which fish meal is handled through one organization. South African fish meal has earned the confidence of world buyers as a quality product whose delivery creates no problem for the purchaser.

The South and South-West African industry was represented at the September 1960 conference in Paris of the International Association of Fish Meal Manufacturers. The five major fish-meal exporting countries reached, in principle, general agreement on the marketing of their product. In 1961 it was expected that the fish-meal consuming countries--non-producers and those whose production fell below national requirements--would need about 900,000 metric tons. This

would be met by an anticipated export surplus of about the same quantity from Peru, Norway, South and South-West Africa, Angola, and Iceland. These five countries agreed in principle to maintain their exports within an agreed share of total exports.

Commenting on the drastic drop in the price of fish meal, the Fish Meal Association Chairman said he had originally believed that over-production, coupled with disorganized marketing, had been the main disruptive factor. He was now convinced that the decline was due almost entirely to disorganized marketing. In the closing months of 1960 he claimed there were no substantial unconsumed stocks of fish meal. The 1960 production was sold, but fluctuations in supply with abundance alternating with comparative scarcity have badly upset prices. Earlier in the year high production in South Africa, Peru, and other countries had brought meal down to a low of US\$80 a ton c.i.f. This was an uneconomic price far below the real value of the commodity. In August-October 1960, a drop in production and export supply, had sent the price up to more than \$100 a ton; in November the price had dropped again to \$85-87. If exporters could agree to maintain a stable flow, it would assist both them and buyers who have also been adversely affected by the unreliability of the market. (The South African Shipping News and Fishing Industry Review, December 1960.)



South-West Africa

FISHERIES THIRD MOST VALUABLE INDUSTRY:

Fishing is the third most important activity in South-West Africa's economy, after mining (diamonds and copper) and livestock-raising (cattle and karakul). There are roughly £7-£8 million (US\$19.6-22.4 million) invested in the industry, of which over £1 million (\$2,800,000) is invested in the spiny lobster (Jasus lalandii) industry. Most of the remaining investment is based on the pilchard (Sardinops ocellata) industry. The total value of South-West African fish products at the manufacturer's level during 1959 was estimated at £8.4 million (\$23.5 million) as compared to £9.3 million (\$26.0 million) in 1958. (The decline was due to a planned reduction of the canned pilchard pack.)

The spiny lobster industry, based at Luderitz, employed as of July 1960, 39 boats and

South-West Africa (Contd.):

about 300 Portuguese fishermen. Luderitz has six factories for the production of frozen spiny lobster tails, canned spiny lobster meat, and meal.

Table 1 - South-West Africa's Landings and Production of Processed Spiny Lobster, 1957-59

Year	Processed Production			
	Landings ¹	Canned	Frozen Tails	Meal
		(1,000 Lbs.)		
1959	11,534	503	2,478	2,131
1958	8,897	430	1,777	1,882
1957	16,867	1,808	1,374	3,369

¹/Whole spiny lobsters.

The Administration, as a conservation measure, usually limits spiny lobster products export (except meal) to 3 million pounds a year. The major market is the United States; the dollar value of the 1958 canned meat and frozen tail production was estimated at US\$1,979,000 at the packers' level.

The pilchard or sardine industry, based at Walvis Bay, employed as of July 1960, 71 boats and 707 fishermen. The six factories producing canned pilchards, fish meal, and fish oil, employed, as of August 1959, 2,600 persons.

From 1952 to 1956 each factory was allowed an intake quota and these quotas totaled 250,000 short tons a season. In 1959, this total was raised by 10,000 tons, but was to include the maasbanker or jack mackerel (*Trachurus trachurus*) which are caught in small quantities. For the 1959 season a temporary quota increase amounting to 40,000 tons was also granted. In 1960 the additional limit was again allowed—a total quota of 310,000 short tons. In 1961, each of the four larger factories will have a quota of 48,750 tons, and the two smaller factories will be allowed 40,000 tons each, for a total of 275,000 tons. It is probable that an extra allowance for the 1961 season will also be granted, as for 1959 and 1960.

Table 2 - South-West Africa's Pilchard and Maasbanker Landings, 1955-60

Year	Pilchard	Maasbanker	Total
	(Short Tons)		
1960	(Breakdown not available)		1/310,000
1959	298,968	2,527	301,495
1958	252,556	5,469	258,025
1957	250,757	-	250,757
1956	250,264	783	251,047
1955	249,756	2,465	252,221

¹/Estimate.

Table 3 - South-West Africa's Production of Canned Pilchards, Fish Meal, and Fish Oil, 1955-60

Year	Canned Pilchards	Fish Meal	Fish Oil
	(Short Tons)		
1960	113,124	55,150	14,905
1959	41,943	60,852	19,377
1958	56,422	46,200	12,381
1957	42,838	46,768	10,793
1956	32,760	49,655	13,095
1955	23,154	51,878	11,859

Other fish caught in commercial quantities are: snoek, kabeljou, steenbras, sole, kingklip, stockfish, shark, and skate. In 1959, a total of 3,406 short tons of these fish were landed, of which 2,471 tons were snoek. The snoek (*Thyr-sites atun*) is salted, dried or smoked for export and was worth about £260,000 (\$728,000) in 1959 to the processor.

The South-West Africa Administration exercises close control over the fishing industry for the purpose of conserving the fish resources. Minimum sizes are established for landings of spiny lobsters, snoek, and whitefish. There is a limit to the gross tonnage of boats to be employed by each factory. Total factory intake quotas for pilchard and maasbanker, export quotas on spiny lobster, and the licensing of a limited number of processing plants are all conservation measures. The fishing season, formerly limited to March-November, is not presently restricted to a prescribed period of the year.

The Territory operates four fishing research vessels, two for pilchard study and two for spiny lobster study. In addition, the migration of pilchards is studied by tagging thousands annually. (United States Consulate, Cape Town, January 26, 1961.)



Spain

TUNA AND BONITO FISHERY TRENDS, 1960:

The 1960 bonito season (from May until early November) in Spain was reported to be steady and good, although the total catch may have been somewhat below that of 1959. Nevertheless, profits to fishermen and shipowners were believed to have been equal to 1959 profits, or higher, due to better prices, which ranged from 17.5 to 18 pesetas per kilo (about 13 U. S. cents a pound) as compared with 15 to 16 pesetas a kilo (11-12 cents a pound) in 1959.

Spain (Contd.):

Sixteen vessels, mostly from Bermeo, in December 1960 were participating in the tuna-fishing season off the west coast of tropical Africa, and selling their catches to United States firms in Freetown, Sierra Leone. Contract prices reported were 8 and 8.5 pesetas per kilo (US\$118-128 a short ton) delivered whole in Freetown. In 1959 the fleet operating from Dakar caught 2,050 metric tons of tuna which was sold under contract for 9 pesetas per kilo (US\$136 a short ton), eviscerated, to a firm in Las Palmas, Canary Islands. (United States Consulate, Bilbao, January 10, 1961.)

Note: Values converted at rate of 60 pesetas equal US\$1.

VIGO FISHERIES TRENDS, OCTOBER-DECEMBER 1960:

Fish Exchange: Landings at the Vigo Fish Exchange for the fourth quarter of 1960 amounted to 19,141 metric tons, an increase of 645 tons over the fourth quarter of 1959. The value of the catch, however, decreased from 191,821,000 pesetas (US\$3,197,000) in the fourth quarter of 1959 to 170,647,000 pesetas (US\$2,844,000) in the final quarter of 1960. The average price per kilo was 8.90 pesetas (6.7 U. S. cents a pound) for the last three months of 1960 and 10.37 pesetas per kilo (7.8 U. S. cents a pound) for the same period of 1959. Third quarter 1960 landings



Small lampara beach boat.

of 20,425 tons, valued at 221,342,972 pesetas (US\$3,689,000) were slightly higher than for fourth quarter, but the average price per kilo was 10.8 pesetas (8.2 U. S. cents a pound).

Table 1 - Vigo Landings and Average Ex-Vessel Prices for Selected Species, October-December 1959-60

Species	Oct.-Dec. 1960			Oct.-Dec. 1959		
	Qty.	Avg. Price		Qty.	Avg. Price	
	Metric Tons	Pesetas/Kilo	US\$/Lb.	Metric Tons	Pesetas/Kilo	US\$/Lb.
Sardines	7,026	4.67	3.5	11,186	3.86	2.9
Horse mackerel.	3,430	3.66	2.8	2,228	4.25	3.2
Small hake . .	2,434	24.00	18.1	2,418	24.84	18.6

Albacore landings of 3,351 tons during the third quarter of 1960 dropped seasonally to 14 tons during the fourth quarter. Promfret landings, which were good in the fourth quarter of 1959 with 1,757 tons, were down to 72 tons for the same period of 1960. Large hake landings were 125 tons, 118 tons, and 203 tons for fourth quarters of 1960 and 1959, and the third quarter of 1960, respectively.

Table 2 - Distribution of Landings at Vigo, Third and Fourth Quarters, 1960, and Fourth Quarter 1959

	Shipped Fresh to Domestic Markets	Canning	Other Processing (Smoking, Drying, Fish Meal, etc.)	Local Consumption
	(Metric Tons)			
1960:				
4th Qtr.	10,336	4,601	3,179	1,025
3rd Qtr.	10,078	5,085	3,963	1,299
1959:				
4th Qtr.	12,962	3,766	5,569	983

Fishery landings (preliminary statistics) at the Vigo Exchange in 1960 totaled 65,457 tons valued at 660,645,000 pesetas (US\$11,011,000), a drop of 13 percent in both quantity and value from the 1959 level of 75,136 tons valued at 759,836,000 pesetas (US\$12,664,000). The decrease was due to reduced landings of sardines, small hake, pomfret, and albacore during 1960.

Fish Canning and Processing: Canning activity in the last quarter of 1960 was down from the third quarter peak which marked the height of the albacore season. Sardines and various specialty products, such as mussels, clams, and squid, formed the bulk of the canning during the last quarter of 1960. Sardine landings during the period were made up for small fish, but the canners packed them with a view to low-priced exports.

Exports of Canned Fish: No figures as of the middle of January 1961 were available on export levels of canned fish from the northwest area of Spain for the fourth quarter or

Spain (Contd.):

for the year 1960. However, it is known that exports to the United States were far below the 1959 level because of the failure to meet Japanese competition in canned albacore. Exports to Switzerland and other countries are believed to have taken up some of the excess stocks and the industry has been active in trying to open new markets, particularly in the Far East for lower-priced products, such as the small sardine.

A strong call for cooperation among fish canners in the export field appeared in an editorial in the December issue of the trade journal *Industrias Pesqueras*. Pointing out that the real future of the industry lies in exports and not in expectations of a substantially increased domestic market, the editorial argues that the type of destructive competition which has characterized the domestic market must be avoided in the export field. Instead, all exporters of canned fish should join in a firm accord as to prices and quality and for the development of a joint advertising campaign.

The article cites the example that Spain, which once dominated the import market of canned fish in Germany, has lost that market to the Portuguese, who have been successful in making their products known. Calling unity the order of the day in international trade, the editorial concludes that in addition to certain measures which the industry needs such as tariff protection, export premiums, and raw materials at international prices, cooperation within the industry to promote itself in the export field is an absolute necessity.

Canned fish sales in the domestic market were reported to be 30 to 50 percent below normal, attributable to the relatively high prices for Spanish canned fish and reduced consumer income. Recent changes in State taxes on canned fish (elimination of the so-called Costs Tax and the Stamp Tax effective January 1, 1961) will result in some savings to the canners, but at the moment it is not expected that these changes will result in lower prices, as the canners claim to have been making sales at or near cost. Both of the taxes to be eliminated as of January 1, 1961, were subject to agreements between the canning industry and the Ministry of Finance. The collective costs tax, theoretically 5½ percent of the value of do-

mestic sales, agreed to between the Finance Ministry and industry representatives, was 43,746,762 pesetas (US\$729,112) during 1959. It has been estimated that this figure represents an effective tax of approximately 3 percent. The Stamp Tax was 5 million pesetas (US\$83,333) for 1960. These reductions will have no direct effect on exports since the taxes were levied only on domestic sales. (United States Consulate, Vigo, January 18, 1961.)



Surinam

SHRIMP INDUSTRY:

A United States company has exclusive rights for the export of shrimp from Surinam. Information furnished by this company and the Surinam Fisheries Division, Department of Agriculture, Animal Husbandry, and Fisheries indicates the following yearly landings of heads-on shrimp: 1960 (estimated), pink shrimp, 900,000 pounds; 1959, pink shrimp, 570,000 pounds and sea bob, 1,650,000 pounds; 1958, pink shrimp, 225,000 pounds and sea bob, 1,850,000 pounds; 1957, pink shrimp, 96,000 pounds and sea bob, 715,000 pounds; and 1956, sea bob, 1,600,000 pounds.

Two species, pink shrimp (*Penaeus brazilensis*) and sea bob (*Xyphopenaeus kroyeri*), comprise the bulk of the shrimp caught off Surinam. Since trawling operations for the larger pink shrimp began in October 1958, production of the small sea bob has declined. The sea bob has never figured largely in the export market, being principally absorbed locally. Accurate breakdown of the figures into size groups are not available but it is estimated that the present catch will run heads-off 30 percent 15 count and under per pound, 48 percent 16-20 count per pound, 20 percent 21-25 count per pound, and 2 percent smaller shrimp.

The number of vessels fishing has varied from 3 to 12. Presently there are only 3 vessels fishing out of Paramaribo. The trawlers operating in the area range from 68 to 85 feet and use marine Diesel engines rated at 175 to 300 horsepower. There is currently no construction program for vessels.

The three boats now operating in Surinam are United States-owned, as have been most of the trawlers which have been here.

Surinam (Contd.):

According to the Fisheries Division, export prices for heads-off shrimp have been as follows: 1958, 150 count per pound, average 55 U. S. cents a pound and 10-25 count per pound, average 90 cents a pound; 1959, 10-25 count per pound, average 80 cents a pound; and 1960, 10-30 count per pound, average 65 cents a pound.

Virtually all shrimp exported go to the United States. The figures on exports available from the Fisheries Division list annual values as follows: 1956, 98,000 pounds, frozen, peeled, US\$70,000; 1957, 44,000 pounds, frozen, heads-off, \$30,000; 1958, 110,000 pounds, frozen, peeled, heads-off, \$75,000; 1959, 290,000 pounds, frozen, heads-off, \$260,000; and 1960, 425,000 pounds, frozen, heads-off, \$260,000 (estimated).

There are no export controls or subsidies, but the Surinam government levies a token export tax of one percent.

Workers in the processing plant receive 45 to 60 Surinam cents per hour depending upon the job and the worker's degree of skill. This is equivalent to about 25 to 32 U. S. cents per hour.

The captain of the vessel is paid \$300 per ton of shrimp. From this amount he pays for groceries for the crew and the crew's wages. The average rate for Surinam crewmen is Sf. 40.00 per ton or about US\$21.40 per ton per crewman. The captain can expect to make US\$150 to \$175 per ton after expenses, and landings run from 4 to 6 tons per month.

The Fisheries Division believes that the industry could be expanded to a total catch of 2.2 million pounds of sea bob and 2 million pounds of pink shrimp. The large shrimp now go almost exclusively to the United States and presumably would continue to be so exported. The small sea bob now are usually cooked and dried for local consumption. The Fisheries Division is now attempting to determine the feasibility of canning the small shrimp for export to various countries, including the United States. (United States Consulate, Paramaribo, January 31, 1961.)



Sweden

INTERNATIONAL FISHERIES EXPOSITION
PLANNED FOR NOVEMBER 1961:

Plans are being made for an international fisheries exposition to be held on the Svenska Massan fair grounds (Swedish Industries Fair) in Goteborg, November 9-19, 1961.

Invitations will be extended to boat builders, engine- and gear manufacturers, as well as the canning and freezing industries. Swedish west coast commercial fishermen will be represented through their trade and economic organizations.

The increasing significance of the Swedish fishing industry and the large interest shown at the expositions in Copenhagen, Denmark, and Bergen, Norway, has made it possible to realize plans for such an exhibition in Goteborg. (United States Consulate, Goteborg, January 7, 1961.)

MARITIME EXPOSITION
INCLUDES FISHERIES:

A Maritime Exposition with a fisheries section will be held in Halsingborg, Sweden, August 11-27, 1961, according to Fiskaren (January 18, 1961), a Norwegian fishery trade periodical. Fishing boats, fishing gear, and special machines for the processing of fishery products will be exhibited.

TRAWLERS DELIVERED TO WEST COAST
FISHING FLEET IN 1960:

A total of 32 new trawlers of more than 70 feet were delivered in 1960 to Swedish west coast fishermen, as against 23 trawlers in 1959. The 1960 deliveries comprised 14 steel trawlers of which 10 were built in Sweden, 3 in Holland, and 1 in Norway; and 18 wooden trawlers, 10 of which were built in Sweden and 8 in Norway.

The largest vessel delivered in 1960 was a 94-foot steel trawler. The size of the steel trawlers varied from 94 to 83 feet. The size of the wood trawlers varied from 84 to 72 feet.

At the beginning of 1961 there were 41 steel trawlers on order, of which 8 will be built in Sweden, 6 in Holland, 11 in East Germany, and 16 in Norway. The number of

Sweden (Contd.):

wooden trawlers on order through agents totaled 21, of which 8 will be built at Swedish yards and 13 in Norway. In addition, fishing teams have placed a few orders for wooden trawlers directly with the yards.

The largest trawlers on order at present are the 11 steel trawlers on order with an East German yard with a length of 105 feet, but inquiries have been made for larger trawlers.

The largest motor installed in the trawlers delivered in 1960 totaled 595 hp. The horsepower rating on the trawlers on order will increase, however, and at least 15 trawlers will have engines of more than 600 hp, and one trawler will have an 800-hp. engine installed. (United States Consulate, Goteborg, February 1, 1961.)

TRAWLERS REPORT LARGE SOVIET FISHING FLEET OFF NORWEGIAN COAST:

A large Soviet fishing fleet consisting of 1,000 vessels was fishing for large herring on the banks off the southwestern Norwegian coast at Egersund early in February. Consequently, a large fishing area usually frequented by Swedish fishermen was for some days closed to them, according to reports from fishermen returning to Goteborg, Sweden, from the North Sea.

The Swedish fishermen say this resulted in extra long trips to reach fishing grounds. One case is cited of a Swedish west coast fisherman who was forced to travel at full speed for more than two hours before he was far enough away from the last Soviet vessel to set his trawl.

The Soviet fishermen were not using trawls, but fished with drift-nets. The cotton drift gill-nets are 108 feet long and each vessel has at least 100 nets. Catches were delivered to a mothership at the fishing site. (United States Consulate, Goteborg, February 7, 1961.)



Taiwan

FISHERIES LANDINGS IN 1960:

The 1960 fishery landings in Taiwan of 259,140 metric tons again surpassed the previous record in 1959. The most significant increase took place in the deep-sea fisheries.

Taiwan's Fishery Landings, 1957-60				
Type of Fishery	1960	1959	1958	1957
	(Metric Tons)			
Deep-sea fisheries . . .	85,310	76,411	61,160	52,223
Inshore fisheries	94,856	91,240	81,720	71,552
Coastal fisheries	30,044	32,183	38,267	38,468
Fish culture	49,030	46,493	48,530	45,878
Total	259,140	246,327	229,677	208,121

The decline in landings from coastal fisheries is due to a drop in the number of boats without power, which are included in this category. Fish culture production showed a slight increase in spite of the floods caused by the August 1 typhoon, which damaged many fishponds. The target for 1960 was 255,000 metric tons and that for 1961 has been set at 270,000 tons.

TWO LARGE TUNA VESSELS UNDER CONSTRUCTION:

The construction of two 550-ton tuna long-liners is taking place in a Japanese shipyard. The vessels will be used for tuna fishing in the Indian and Atlantic Oceans.

CHEMICAL FERTILIZERS USED IN MILKFISH PONDS:

Over 3,000 tons of ammonium sulphate and calcium superphosphate were used in milkfish ponds in 1960. Chemical fertilizers have become increasingly popular with fish farmers in Taiwan due to their lower cost and more rapid action as compared with organic fertilizers. It is estimated that about 5,000 metric tons will be required for 1961.

--T. P. Chen, Chief, Fisheries Division,
Joint Commission on Rural
Reconstruction, Taipei, Taiwan

Note: Also see Commercial Fisheries Review, May 1960 p. 65.



Union of South Africa

EX-VESSEL FISH PRICES FOR 1961 LOWER:

As of January 1, 1961, the price paid by fish cannerys, fish meal and oil producers in

Union of South Africa (Contd.):

the Union of South Africa to private boat owners for each ton of raw fish (pilchard, mackerel, and mackerel) delivered to the factories is £3 19s. 6d. (US\$11.13 a ton). This is a drop of 14 percent from £4 12s. 6d. (\$12.95), the previous official basic price to private boat owners. This price had, however, already been lowered temporarily by 12½ percent as of June 1, 1960, with an understanding that prices for 1961 would be reviewed later in the year.

The review of the price situation was made accordingly in October 1960 by representatives of the canners, meal and oil producers on the one side and representatives of the private boat owners on the other. They met under the chairmanship of the Commercial Adviser to the Department of Commerce and Industries of the Union Government. It was decided that the official price must go still lower and so the price of £3 19s. 6d. was set for this year.

At these meetings a single wage scale for the skippers and crews of both company-owned and privately-owned fishing boats was also established. The wages, also based on the tons of raw fish delivered, are: skipper 10 shillings (\$1.40) per ton; helmsman 4s. 6d. (\$0.63) per ton; driver 4s. 6d. (\$0.63) per ton; and crewman 3s. 8d. (\$0.51) per ton.

As each boat carries seven crewmen, the wage cost per ton is £2 4s. 8d. (\$6.25), leaving the owner £1 14s. 10d. (\$4.38) to cover fuel, insurance, maintenance, depreciation, financing, and a return on his investment. (United States Consulate, Cape Town, February 2, 1961.)

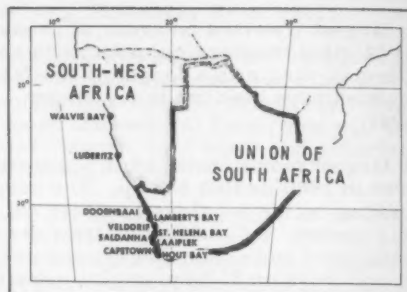
FISH MEAL AND SOLUBLES PRICES, DECEMBER 1960:

Fish meal and solubles prices reported for the month of December by the South African Fish Meal Producers' Association to the Food and Agriculture Organization:

Domestic Fish Meal Price: £38 (US\$106.40) a short ton, free aboard freight car (consignee pays freight). This price was fixed in 1956.

Export Fish Meal Prices: To the United Kingdom: £44/8s.-£33/17s./4d. (\$124.32-94.83) a long ton or about \$111.00-84.67 a

short ton, c.i.f. United Kingdom ports. To West Germany and Netherlands: £39-£37/7s./6d. (\$109.20-104.65) a long ton or about \$97.50-93.44 a short ton, c.i.f. West European ports. To the United States: \$119.50-86.00 a short ton f.o.b. freight cars United States port of entry.



Domestic Fish Solubles Prices: £38 (\$106.40) a short ton, free aboard freight cars.

Export Fish Solubles Price: To West Germany and the Netherlands: £43/6s. (\$121.24 a metric ton or about \$110 a short ton), c.i.f. West European ports.

Prices are for fish meal shipments made in December 1960 and include prices agreed upon some time preceding the shipment.

One spot price obtained directly was for shipments made by a South African subsidiary of a United States firm--\$86.00 a long ton (\$76.79 a short ton), f.o.b. freight cars, United States port of entry.

The protein content of South African fish meal ranges between 60 and 70 percent and the average pepsin digestibility is 94 percent, according to the South African Fishing Research Institute. (United States Consulate in Cape Town, January 23, 1961.)



U. S. S. R.

ATLAS OF NORWEGIAN AND GREENLAND SEAS TO BE PUBLISHED IN 1961:

The Soviet Union's Polar Institute for Fishery and Oceanography is, together with some other Soviet institutes, working out a commercial and industrial atlas covering the Norwegian Sea and the Greenland Sea.

U. S. S. R. (Contd.):

The new atlas will show, in its different sections, the seas' importance for commerce and industry, fishery statistics, the biology of the herring, the relative fluctuations in the concentration of fish, etc.

The new book, which is expected to be a good guide to those engaged in fishing in these seas, will contain over 150 different maps. More than a third of these maps are being prepared by the Polar Institute. They will be special maps showing the sea bottom, streams, the distribution of hydrochemical substances, existing kinds of plankton and their characteristics, spawning grounds, the local occurrence of the herring, results of fish markings, etc. The atlas will be published in 1961, the United States Embassy in Stockholm reported on January 20, 1961.

FOUR MORE FISH FACTORYSHIPS
ORDERED FROM DENMARK:

The U. S. S. R. has ordered four more fish factoryships from a shipyard in Denmark, according to Fiskaren (January 25, 1961), a Norwegian fishery trade periodical. This brings the number of special factoryships delivered by that same Danish yard to the Soviet Union to 25. The new order for the four vessels is valued at over 30 million Danish kroner (US\$4.4 million). The factoryships will be 2,600 tons each. Each will serve as a mothership for a fleet of Russian trawlers whose catch will be handled by the specialized factoryship. Equipped for freezing, filleting, packaging, and the manufacture of fish meal and fish oil, each vessel will carry a crew of 102.



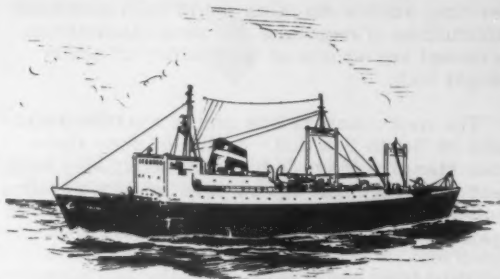
United Kingdom

EXPERIMENT ON TRANSFER OF
FISH AT SEA FROM TRAWLER
TO FACTORYSHIP:

The first practical experiments in the transfer of fish at sea from a trawler to a factoryship are focusing the fishing world's attention on two British ships on the Grand Banks off Newfoundland.

The catch of the trawler Ross Hunter from Grimsby is transferred at sea to the factoryship Fairtry II from Leith, and the

factoryship processes the catches of the trawler and her own. The two ships will be at sea some 80 to 90 days.



The Fairtry II, British factoryship trawler.

The 171-foot, 550-gross-ton Ross Hunter with her 20 experienced deep-water fishermen is on the longest fishing voyage ever made by a Grimsby trawler. All of them volunteered, under a special remuneration agreement.

The trawler does not carry sufficient fuel oil to permit her to work continuously for the three months, so she will be calling when necessity arises into St. John's, Newfoundland, to obtain fuel oil, ice, water, and other essentials.

A supply of special detachable cod ends has been put aboard the trawler to facilitate transferring the catch to the 2,857-ton Fairtry II for processing and freezing.

New methods will be tried in the investigation into the easiest and most efficient system of transfer of fish at sea.

Up to now the only experiments in the transfer of fish from one ship to another at sea were carried out in 1960 by two other British vessels. Unlike the ambitious refinements of the present research, the system relied on special net containers, resembling gigantic sausages. (The Fishing News, January 13, 1961.)

FISH QUALITY MEASURED WITH
PHOTOELECTRIC CELL:

The Torry Research Station, Aberdeen, Scotland, has devised a machine which will measure very quickly the condition of cod, and possibly other white fish, by measuring the milkiness of the meat.

United Kingdom (Contd.):

According to Torry's scientists, in a broadcast over the BBC's Scottish Home Service, such a machine could help solve the difficulties of handlers and processors from seasonal variations in the quality of newly-caught fish.

The new machine has shown that the milkiness of North Sea cod--a sign of poor fish--rose steadily from January to about May each year, and then fell again, presumably as more food became available and condition improved again.

"Our final proof that condition and milkiness were related was this. We found that we could make the fillets go milky whenever we liked simply by starving live cod which were living in an aquarium," the report indicated.

As the condition of the fish changes, so does the chemical composition. The scientists in carrying out chemical analyses find that the results are rarely the same from one month to the next, nor are they the same in fish from different fishing grounds.

The natural variations, according to the report, are caused by spawning, and also by a lack of sufficient food at certain times of the year. When the fish are spent and starving, the meat becomes more watery and less suitable for processing. They can't be made into satisfactory smoked products, and they are soft and flabby to the touch.

The amount of fat or water in the meat gives a good guide to the condition of the fish, but these measurements usually take a long time.

One way to recognize a poor fish is by the look of the fillets which are a dense white instead of being almost transparent, as they are in a well-fed fish.

In the new method of measuring this condition, a large flake is cut from a fillet and placed in the machine developed by the Torry Laboratory. A light shines on it, and the amount of light which gets through the sample is measured with a photoelectric cell. This is more sensitive than the human eye, so it can detect much smaller changes in milkiness.

With this method the Torry scientists now hope to study the condition of cod at different fishing grounds, and the effect of age and sex on their condition.

"By doing this we should be able to sort out some of the complicated factors that go to make up quality, and to find out what decides whether or not a particular fish will make a good or bad product," the report reveals. (The Fishing News, February 10, 1961.)

FISH MEAL PRICES, FEBRUARY 1961:

Fish meal prices reported by a British trade periodical between November 19, 1960, and February 4, 1961, were as follows:

Type of Fish Meal	Protein Content	Date Quoted	£/s per Long Ton	US\$1	
				Long Ton	Short Ton
S. Africa (white fish)...	65	11/19/60	48/15	136.50	121.87
Peru (branded)...	65	2/4/61	36/10	102.80	93.26
Peru (average quality)....	65	2/4/61	33/0	92.40	83.83
Iceland (white cod).....	70-73	11/26/60	42/0-48/16	117.60-136.64	105.00-122.00
Iceland (herring)	70	2/4/61	43/15	122.50	109.37
Denmark (herring).....	73	2/4/61	47/9	132.86	120.53
Domestic (white fish).....	66	2/4/61 ^{1/}	56/10	158.20	141.26
Domestic (herring) 2/.....	68-71	2/4/61	50/0	140.00	125.00

1/ Effective February 1, 1961; in bags.

2/ In bags ex-warehouse.

Note: Imported fish-meal prices are c.i.f. current shipments, and domestic-meal prices (net cash) are ex-plant, in 6 long-ton lots and bagged, unless otherwise reported.

(United States Embassy, London, February 9, 1961.)

STUDY ON IMPORTED CANNED SALMON:

The British Consumers' Association Ltd. in the January 1961 issue of their official publication Which?, published an analysis of canned salmon available in the United Kingdom. Although the survey was not comprehensive, only 22 of some 70-odd brands being included, most popular brands were included as well as particularly expensive and particularly cheap ones.

Conclusions of the survey of particular interest to the United States industry include

United Kingdom (Contd.):

the following: (1) A United States brand was found to be of the highest quality of all the brands tested; it was also the most expensive. (2) A half-dozen of the 22 brands tested included cans from more than one country. In an effort to analyze the relative quality produced by each country, cans from these brands were regrouped according to country of origin rather than company. Tests in this instance indicated that United States brands had the best flavor, followed by Canadian, Japanese, and Russian in that order. United States canned salmon also had better character and color than that from the other three countries. (3) In contrast, the Consumers' Association quantitative tests indicated that Russian cans weighed most, with Japanese cans a close second. Canadian cans weighed least, but United States cans were very close to the Canadian. On the average there was about $\frac{1}{2}$ -ounce difference per $7\frac{3}{4}$ -ounce can between the Russian and the Canadian average weight. (4) In terms of equal character, flavor, color, consistency, weight, and price, the Consumers' Association found three Japanese brands to be the best buy in the red, medium, and pink packs.

Canned salmon is normally available in three sizes--quarter, half, and one pound; the half-pound size is the most popular and all tests were on this size.

Almost all canned salmon is imported from four countries: Canada, Japan, United States, and U.S.S.R. The salmon is caught in northern Pacific waters. It is usually sold under the labels red (or sockeye), medium red (coho or silver), pink, and chum (keta). Red and pink salmon are most widely sold.

The cans tested from Canada, the United States, and U. S. S. R. stated the country of origin on the label. Those from Japan were labeled "Japan" or, more frequently "foreign." Cans from Canada had the word "Canada" embossed in the metal, and most cans, from all four countries, were embossed with a code to indicate the type of salmon, the canner, and the date of canning.

The study found, from the embossed code, that cans of different brands were sometimes products of the same cannery; and that cans of the same brand were often products of a number of canneries, not necessarily all in one country.

In all cans the proportion of skin and bones was fairly constant (about $\frac{1}{2}$ ounce), while the liquid drained off was about $1\frac{1}{2}$ ounces. (United States Embassy, London, February 15, 1961.)



Venezuela

FISHERIES TRENDS, FALL 1960:

Routine sampling of Venezuelan commercial sardine catches for age, growth, and spawning studies were being continued in the fall of 1960 by the Marine Biological Institute under the direction of a Food and Agriculture Organization biologist, and a study of the early life history of the species was progressing with the building up of a progressive series of the embryonic stages.



Boat for transporting sardines in Venezuela.

Salinity data from fixed oceanographic stations over a period of 10 months indicate that the salinity of the water column has remained essentially the same, the values ranging from 36.56 percent to 36.89 percent at the surface, and from 36.64 percent to 36.76 percent at about 33 fathoms.

The Venezuelan Banco Agricola y Pecuario will give a loan of 1.5 million bolivars (about US\$500,000) to the fishing cooperative of Zulua and a similar credit will be given to a fisherman's cooperative being organized in eastern Venezuela. The principal objective of these loans is to help the small fishermen in acquiring nets and other fishing equipment and housing and to ultimately reduce fish prices to consumers.

Venezuela (Contd.):

It is also hoped that through this assistance the small fishermen will be able to compete with the trawlers supplying the larger com-

mercial fishing and canning companies (which employ about 3,000 people) with their raw material. (West Indies Fisheries Bulletin, Sept.-Oct. 1960, No. 5.)

CORRECTION

In the article entitled "Physical and Chemical Properties of Shrimp Drip as Indices of Quality," which appeared in the January 1961 issue of Commercial Fisheries Review, on p. 12, in each of the graphs shown in figure 3, the following legends were omitted:

Top graph:

Lot 1 - iced storage

pH 
 Organoleptic score 

Middle graph:

Lot 1 - iced and frozen

pH 
 Organoleptic score 

Bottom graph:

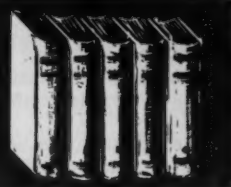
Lot 3 - iced storage

pH 
 Organoleptic score 

The corrected figure appears in the reprint of the article Separate No. 610.



FEDERAL ACTIONS



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

SUBSTANCES ADDED TO FOOD ADDITIVES LIST SAFE FOR USE:

On February 2 and August 4, 1960, there were published in the Federal Register two lists of substances which the Commissioner of Food and Drugs proposed to list among those recognized as safe for use in foods, subject to the limitations specified. After careful consideration of the views and comments filed, the Commissioner concluded that the substances named in the proposals may properly be added to the list of substances generally recognized as safe.

The substances which have been added to the list of those generally recognized as safe appeared in the Federal Register of January 31, 1961, and include anticaking agents, chemical preservatives (including ascorbic acid), emulsifying agents, nonnutritive sweeteners, nutrients and/or dietary supplements, sequestrants, stabilizers, and a number of miscellaneous and/or general purpose food additives. Over 250 substances are listed.

ADDITIONAL TIME FOR CLEARANCE OF FOOD ADDITIVES PROPOSED:

Support of a legislative proposal to allow industry additional time for scientific study and safety clearance of food additives which were in commercial use before January 1, 1958, was announced February 16, 1961, by the Secretary of Health, Education, and Welfare. The draft bill was sent to the Chairman of the House Committee on Interstate and Foreign Commerce by letter of January 13, 1961, by the former Secretary of the Department.

At that time the Commissioner of Food and Drugs said the proposed extension beyond

the March 6, 1961, final deadline of the Food Additives Amendment of 1958 was needed to permit manufacturers to complete safety studies, where such studies or other bona fide actions to determine the applicability to the amendment were begun on food additives prior to March 6, 1960.

The additional time would be allowed for those additives which were in commercial use before January 1, 1958, and which were given time extensions until March 6, 1961, on the basis of findings that such continued use would involve no undue risk to the public health. About 3,000 such additives received time extensions. The proposed bill would allow further time only on a case-by-case basis and where procedures were started by the manufacturer or user of the additive before March 6, 1960, looking toward a resolution of any food additive problem involved. The amount of additional time would likewise be individually determined by the Food and Drug Administration on the basis of the facts in each case. The Commissioner said this was in line with provisions in the recently enacted Color Additives Amendment.

COLOR ADDITIVES PROPOSED REGULATIONS:

The Food and Drug Administration has published proposed procedural and interpretive regulations for administering the new Color Additives Amendments to the Federal Food, Drug and Cosmetic Act to assure safety of colors used in foods, drugs and cosmetics.

The proposed regulations were published in the Federal Register, January 24, 1961, and 30 days were allowed for comment on the proposed regulations.

The regulations cover such matters as definition of terms, fees to be charged for listing and certification of batches of colors, labeling requirements for colors, time

schedules for acting upon petitions, protection of trade secrets, procedures for obtaining certification, or exemption from certification of batches of both coal tar and non-coal tar colors; and procedures for filing objections and requesting public hearings on proposed regulations.

The regulations would further provide that a safety factor of 100 would ordinarily be used in applying animal experimentation data to man, unless use of a different factor is supported by the data submitted; and would provide for taking into account any probable additive effect of the toxicity of the color with that of other related colors or with food additives or pesticides which may also be present in foods.

REGULATION PROPOSED ON SOURCES OF RADIATION USED IN FOOD INSPECTION AND CONTROLLING PROCESSING:

The Food and Drug Administration of the U.S. Department of Health, Education, and Welfare in the Federal Register of July 9, 1960, published an order establishing a regulation providing for the safe use of certain radiation sources for the inspection of foods and food packages and for controlling food processing. The Agency has evaluated certain objections received since the publication of the proposed regulation in the Federal Register of March 2, 1961, amended the proposed regulation, and republished it in full as amended.

As now published, the proposed regulation provides certain conditions for the safe use of sources of radiation for inspection of foods, for inspection of packaged food, and for controlling food processing. In addition to specifying the source of the radiation, the proposed regulation specifies the type of information that is to appear on the labels of the radiation units.

Interested persons had until April 1, 1961, to submit views and comments on the proposed regulation.



Department of State

INTERNATIONAL COOPERATION ADMINISTRATION

FISHERIES GRANTS

TO FOREIGN COUNTRIES:

A list of financial grants by the International Cooperation Administration in fiscal year 1960 to aid and rehabilitate the fisheries of a number of foreign countries appeared in the March 7, 1961, Congressional Record. Senator Gruening presented the list in the Senate for publication. The fishing projects financed for fiscal year 1961 follow:

Agriculture and natural resources	
	Fiscal year 1960 amount
Far East:	
Cambodia: Fisheries conservation.....	\$31,000
China, Republic of: Fisheries development.....	28,000
Indonesia: Expansion and modernization of marine and inland fisheries.....	77,000
Korea: Fisheries development (typhoon rehabilitation)....	1,461,000
Vietnam: Fisheries development.....	409,000
Near East and South Asia:	
India: Expansion and modernization of marine and inland fisheries.....	40,000
Pakistan:	
Fisheries development.....	44,000
Reobligation—fisheries development.....	30,000
AFRICA:	
Liberia: Fresh water fisheries.....	38,000
Somali Republic: Fisheries improvement.....	61,000
Tunisia: Aid to commercial fisheries.....	18,000
Europe:	
Spain: Inland fishing.....	2,000
Latin America:	
British Guiana: Fisheries.....	4,000
Total.....	2,231,000

Note: Also see Commercial Fisheries Review, October 1960 p. 98. (Correction: The total amount shown in that issue for fiscal year 1957 should have read \$3,559,000.)



Eighty-Seventh Congress

(First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



CATCH TRANSFER AT SEA: H. R. 4626 (Thompson of Texas), introduced in House February 20, a bill relating to documentation and inspection of vessels of the United States. Would legalize transferring of the catch of one fishing vessel to another on the high seas, and transporting it without charge to a United States port. Also, on Feb. 23: H. R. 4853 (Bennett of Fla.); Feb. 28: H. R. 5029 (Matthews); Mar. 1: H. R. 5088 (Herlong); Mar. 9: H. R. 5420 (Tollefson); Mar. 23: H. R. 5889 (Rogers of Fla.); to Committee on Merchant Marine and Fisheries. On Mar. 7, S. 1222 (Yarborough), introduced in Senate; to Committee on Interstate and Foreign Commerce.

COLUMBIA RIVER BASIN TREATY: On Mar. 8, the Senate Committee on Foreign Relations held and concluded hearings on the treaty between the United States and Canada concerning cooperative development of the water resources of the Columbia River Basin (Ex. C, 87th Cong., 1st Sess.). On Mar. 14 the committee met in executive session and approved the treaty, and reported favorably upon it (Ex. Rept. No. 2). On Mar. 16 the Senate proceeded to consider ratification of treaty and adopted resolution of ratification by 90 yeas and 1 nay.

Columbia River Treaty (Hearing before the Committee on Foreign Relations, United States Senate, 87th Congress, 1st Session, on Ex. C, 87th Congress, 1st Session, Mar. 8, 1961), 84 pp., printed. The purpose of the treaty is to insure the development of the water resources of the Columbia River Basin so that both countries obtain the maximum advantage in the production of hydroelectric power, flood control, and other benefits. Contains statements of various Senators of the Northwest States; testimony and prepared statements of the Secretary of the Interior, Under Secretary of State, and U. S. Army Chief of Engineers.

Ex. Rept. No. 2, Columbia River Treaty (March 15, 1961. Report of the Committee on Foreign Relations, United States Senate, on Executive C, 87th Congress, 1st Session), 20 pp., printed. The purpose of the treaty is to insure the development of the water resources of the Columbia River Basin so that Canada and the United States can share the maximum advantage in the production of hydroelectric power, in flood control, and in other benefits. The Committee on Foreign Relations concludes that the Columbia River Basin Treaty will provide great benefits to the United States and Canada in power, flood control, irrigation and other water uses--far greater than either country could have if attempted alone, and therefore recommended ratification by Senate. Contains background and purpose of treaty, benefits and costs, committee action, and two appendices.

COLUMBIA RIVER INTERSTATE COMPACT: House March 16 received Memorial of the Legislature of the State of Idaho memorializing the President and the Congress relative to ratifying and approving the Columbia River interstate compact, relating to the division, apportionment, and use of the waters of the Columbia River system; to the Committee on Interior and Insular Affairs.

CRAB MEAT IMPORTS FROM U.S.S.R.: Senator Gruening on March 16 in the Senate requested and had printed in the Record a resolution adopted by the Legislature of the State of Alaska protesting the lifting of the ban on imports of canned crab meat from Russia. The resolution states in part:

"That any proposal for the lifting of the ban on the importation of Russian crab meat is protested

and that it is respectfully requested that the State of Alaska be consulted before any action is taken by the U. S. Government...."

DEPRESSED AREAS: H. R. 4992 (Dulski), introduced in House Feb. 28, a bill to alleviate unemployment conditions in depressed areas; to Committee on Banking and Currency. Also Mar. 7: H. R. 5263 (Donohue), H. R. 5307 (Staggers); Mar. 8: H. R. 5370 (Conte); Mar. 10: H. R. 5476 (Harsha); Mar. 14: H. R. 5584 (Morris), H. R. 5588 (Whalley); H. R. 5530 (Gialmo), H. R. 5539 (Montoya); to Committee on Banking and Currency.

On Feb. 27, Subcommittee No. 2 of House Committee on Banking and Currency held hearings on H. R. 4569. On Mar. 13 the Subcommittee concluded hearings. On Mar. 15 the bill was ordered favorably reported to the full House Committee on Banking and Currency, H. R. 4569 (amended).

On Feb. 28, the Subcommittee on Production and Stabilization of the Senate Committee on Banking and Currency concluded its hearings on pending depressed areas legislation (S. 1, S. 6, S. 9, and S. 750). On Mar. 2, the Senate Subcommittee met in executive session and approved for full committee consideration with amendments S. 1. On Mar. 6 the Committee ordered favorably reported with amendments S. 1. The bill, as approved, would authorize expenditures of \$394 million and would vest its administration under the Department of Commerce headed by an administrator appointed by the President. On Mar. 8, S. 1 was reported favorably (S. Rept. No. 61) to the Senate with amendments. On Mar. 10 the Senate resumed consideration of S. 1.

Senate on Mar. 15 by 63 yeas to 27 nays passed with amendment S. 1. House received bill on Mar. 16 and referred it to House Committee on Banking and Currency. On Mar. 21 that committee met in executive session and ordered favorably reported to House S. 1 (amended).

On Mar. 22 the House Committee on Banking and Currency favorably reported to the House S. 1 with amendment (H. Rept. No. 186); referred to the Committee of the Whole House on the State of the Union.

Area Redevelopment--1961 (hearings before a Subcommittee of the Committee on Banking and Currency, United States Senate, 87th Congress, 1st Session, on S. 1, S. 6, S. 9, and S. 750, bills to establish an effective program to alleviate conditions of substantial and persistent unemployment and underemployment in certain economically distressed areas, January 18, 19, 26, and February 20, 1961), 893 pp., printed. The purpose of the bill is for the Federal government, in co-operation with the States, to help depressed areas take effective steps in planning and financing their economic redevelopment; that Federal assistance to communities, industries, enterprises, and individuals in areas needing redevelopment should enable such areas to achieve lasting improvement and enhance the domestic prosperity by establishment of stable and diversified local economies; and new employment opportunities should be created without reducing employment in other areas of the United States. Contains text and digest of each bill; many statistical tables; statements of Government officials; union officials; letters, resolutions, telegrams of various interested parties.

Senate Report No. 61, Area Redevelopment--1961 (March 8, 1961, 87th Congress, 1st Session, report of

the Committee on Banking and Currency together with individual views to accompany S. 1), 80 pp., printed. This legislation is designed to alleviate conditions of substantial and persistent unemployment and underemployment in certain economically-depressed areas. Committee reported bill favorably with amendments. Report presents the background of the bill, purpose, causes of localized chronic unemployment, need for Federal action, comparison of costs, major provisions of the bill, a section-by-section summary, principal amendments, changes in existing laws, and individual news of several members of the Committee, with several tabular appendices on labor force and employment by States.

EXPORT POLICY ACT OF 1961: S. 1379 (Sparkman and 17 other Senators), introduced in Senate March 20, a bill to encourage and promote the expansion through private enterprise of domestic exports in world markets; to Committee on Banking and Currency. An amendment and amplified version of S. 852, which would add important small business provisions to proposals for export promotion contained in earlier bill, in order to encourage and expand participation of small business in exporting.

FISH AND WILDLIFE ASSISTANT SECRETARY OF INTERIOR: Mar. 22 the Senate Committee on Interstate and Foreign Commerce in executive session ordered favorably reported the nomination of Frank P. Briggs, to be Assistant Secretary of the Interior for Fish and Wildlife.

FISH AND WILDLIFE AID THROUGH EQUIPMENT TRANSFER: H. R. 4724 (Barry), introduced in House Feb. 22, a bill to provide that surplus personal property of the United States may be donated to the States for the promotion of fish and wildlife management activities, and for other purposes; to Committee on Government Operations.

FISH HATCHERY: H. R. 5353 (Mills), introduced in House on Mar. 8, a bill to provide that the Secretary of the Army shall construct a fish hatchery for the purpose of increasing the public benefits of the Greers Ferry Dam and Reservoir project, Little Red River, Arkansas, and for other purposes; to the Committee on Public Works.

FISHING VESSEL CREWS TO BE CONSIDERED EMPLOYEES: S. 1265 (Bartlett), introduced in Senate Mar. 8, a bill to amend section 2 (3) of the National Labor Relations Act so as to extend the coverage of such Act to members of the crews of certain fishing vessels. Provides that crews of fishing vessels which are two tons or over that share in the catch of such vessels, which delivers its catch to a particular processor, canner or other buyer, shall be deemed to be employees of the processor, canner, for the purposes of collective bargaining with respect to price or prices to be paid for catch.

FOOD ADDITIVES: On Mar. 1, the House Committee on Interstate and Foreign Commerce concluded hearings on H. R. 3980, a bill to amend the transitional provisions of the Food Additives Act. Would continue the transition period and use of certain food additives and pesticide chemicals pending completion of investigations to June 30, 1964.

Committee on Mar. 3 reported to the House, with amendment, H. R. 3980 (H. Rept. No. 53); referred to the Committee of the Whole House on the State of the Union. On Mar. 13 a report of the Committee on Rules

was delivered to the House Clerk on H. Res. 223, a resolution for consideration of H. R. 3980, food additive legislation, without amendment (H. Rept. No. 73); referred to House Calendar. On Mar. 14, after adopting several committee amendments, the House passed H. R. 3980.

Food Additives--Extension of Transitional Provisions (Hearings before the Committee on Interstate and Foreign Commerce, House of Representatives, 87th Congress 1st Session on H. R. 3980, Feb. 28 and Mar. 1, 1961), 56 pp., printed. This bill would provide for the continuation of the authority of the Secretary of Health, Education, and Welfare to permit the commercial use of certain food additives and pesticide chemicals pending the outcome of investigations and scientific studies now in progress by industries concerned and Food and Drug Administration to determine, what, if any, tolerance limitations or other conditions should be imposed on their use in order to protect the public health. Contains report of Department of Health, Education and Welfare; statements of various Government officials, and business officials, associations, and clubs.

H. Rept. 53, Food Additives Transitional Provisions Amendment of 1961 (March 3, 1961, 87th Congress, 1st Session, report of the Committee on Interstate and Foreign Commerce to accompany H. R. 3980), 15 pp., printed. Would protect the public health by amending the Federal Food, Drug, and Cosmetic Act to prohibit use in food of additives which have not been adequately tested to establish their safety, and for other purposes. Contains report of Department of Health, Education, and Welfare, purpose of legislation, proposed changes in existing legislation.

IMPORTED COMMODITY LABELING: S. 1260 (McGee and Hickey), introduced in Senate on Mar. 8, a bill to amend the Federal Food, Drug, and Cosmetic Act, as amended, to require the labeling of certain imported meats, poultry, and fish; to the Committee on Labor and Public Welfare.

Also H. R. 5118 (Mason), introduced in House Mar. 1. H. R. 5376 (Young), introduced in House Mar. 8; to Committee on Ways and Means.

IMPORT COMPETITION ADJUSTMENT: H. R. 5422 (Tollefson), introduced in House Mar. 8, and H. R. 5835 (Thomson of Wisconsin) introduced in the House Mar. 13; bills to regulate the foreign commerce of the United States by providing for fair competition between domestic industries operating under the Fair Labor Standards Act and foreign industries that supplied articles imported into the United States and for other purposes; to the Committee on Ways and Means.

INTERIOR DEPARTMENT APPROPRIATIONS: Amendments to the Budget for the Fiscal Year 1962 for the Department of the Interior, H. Doc. No. 113, 87th Congress, 1st Session, a communication from the President of the United States transmitting amendments to the Budget for the fiscal year 1962, involving an increase in funds for the Department of the Interior. Among the changes shown is one where the original budget estimate of \$9,296,000 is increased to \$11,796,000 for the Bureau of Commercial Fisheries. The additional amount of \$2,500,000 is to provide for continuation of the emergency salmon research program, initiation of which is being requested in a 1961 supplemental appropriation, and increasing the 1962 level of oceanographic research.

On March 20 the House received Executive Communication 692, transmitting amendments to budget for fiscal year 1962, involving an increase in the amount of \$40,668,000 for the Department of the Interior (H. Doc. 113); to the Committee on Appropriations.

MEDICAL CARE FOR VESSEL PERSONNEL: S. 1265 (Bartlett), introduced in Senate on Mar. 8, a bill to amend section 2 (3) of the National Labor Relations Act so as to extend the coverage of such act to members of the crews of certain fishing vessels; to the Committee on Labor and Public Welfare.

MINIMUM WAGE LEGISLATION: On Feb. 28, the Subcommittee on Labor of the Senate Committee on Labor and Public Welfare began hearings on S. 256, S. 879, and S. 895. Senator Johnson appeared before the Subcommittee and urged retention of the fishery exemption as now written in the law, explaining that both onshore and offshore operations should be exempt. On S. 895, the Administration bill, the Secretary of Labor, who appeared on March 1, included the following statement in his prepared testimony: "The Administration bill has not sought to remove overtime exemptions at this time for employees in occupations where special problems with respect to adjustment of hours of work had been brought out in the hearings before Congressional committees. In all of these areas, we believe that further study should be made." The Director, department of legislation, AFL-CIO, told the Subcommittee on March 2: "We are glad to note that the Administration bill extends wage coverage to workers in fish and seafood processing. This should be coupled with hours protection as well, except for--at most--a 14-week period." He also placed in the record a supplementary statement by the director of research, AFL-CIO, which included the following observation: "Seafood processing and canning workers should be brought fully under the hours provisions or, at the very least, subjected only to a seasonal exemption, for a maximum period of 14 weeks a year." Seattle law firm of Allen, DeGarmo and Leedy submitted to the House Labor Committee a statement on behalf of the companies engaged in the catching and canning of salmon in the Pacific Northwest and Alaska. In it, he requested that a statement of Congressional purpose be included in the Committee report which accompanies H. R. 3935 when it is reported to the House, "describing the application of the fish canning exemption to all employees employed in the enterprise." Also the Special Subcommittee on Labor of the House Committee on Education and Labor met in executive session and ordered reported to the full committee H. R. 3935 (amended). The Administration's bill H. R. 3935, with amendments, was reported on March 2 to the House Committee on Education and Labor. As approved by the Special Subcommittee on Labor, the amended measure, like the bill originally introduced on February 7, would not affect fish cannery's existing year-round exemption from the overtime provisions of the Fair Labor Standards Act. The Subcommittee changed the Administration's proposal for a three-stage increase in the hourly minimum wage for presently-covered employees (\$1.15 this year, \$1.20 a year later, and \$1.25 the following year). The amended bill would provide \$1.15 this year and \$1.25 a year later. The full Committee, in a closed meeting on March 2, endorsed the two-stage recommendation of its Subcommittee.

On Mar. 2, Subcommittee No. 2 of Senate Committee on Labor and Public Welfare continued hearings on S. 256, S. 879, and S. 895. On Mar. 3, hearings continued

and various business witnesses were heard. Also considered in executive session of the House Committee on Education and Labor was H. R. 3935.

On Mar. 6, the Subcommittee on Labor of the Senate Committee on Labor and Public Welfare concluded its hearings on minimum wage legislation, after receiving testimony from various business witnesses.

On Mar. 9, the House Committee on Education and Labor approved H. R. 3935. Bill approved by the Committee would raise the hourly minimum wage for presently-covered employees to \$1.15 four months after enactment and after 24 additional months to \$1.25. No changes are made in the bill in fish cannery's present year-round exemption from overtime pay requirements of the Act. This same exemption from overtime pay requirements also applies to processors of fishery products other than canned. However, the exemption for the fishing industry from the minimum wage under the bill as approved is limited only to offshore or aboard-vessel processing.

On Mar. 13, the Committee on Education and Labor reported to House with amendment H. R. 3935 (H. Rept. 75); referred to the Committee of the Whole House on the State of the Union.

On Mar. 16, Subcommittee on Labor ordered favorably reported to the full Senate Committee on Labor and Public Welfare without recommendation, S. 895.

On Mar. 21, House Committee on rules reported a privileged resolution (H. Res. 229, H. Rept. No. 182) on H. R. 3935.

On Mar. 22, the House concluded consideration of H. Res. 229, providing for consideration of and 7 hours of debate on H. R. 3935, but deferred vote on adoption of rule to Mar. 23.

On Mar. 24, the House passed H. R. 3935. Earlier the House rejected a motion to recommit the bill. While in Committee of the Whole House on the State of the Union, the Ayres-Kitchin substitute amendment was adopted by a teller vote. The Committee amendment as amended by the Ayres-Kitchin amendment was subsequently adopted by the House.

In the amendment offered by Ayres, the Federal minimum wage would be raised to \$1.15 an hour for those employees who are currently covered. Newly-covered employees (about 1.4 millions), will be those who are employed by employers operating 5 or more establishments in 2 or more States, and they will receive a minimum of \$1 an hour with no provision for overtime. Onshore fish processing would be excluded under the minimum wage coverage.

With regard to the provisions in the bill on fishery exemptions, Johnson of Maryland offered this amendment which would have restored exemptions pertaining to onshore fishery operations: "(5) any employee employed in the catching, taking, harvesting, cultivating, or farming of any kind of fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life, including the going to and returning from work and including employment in the loading, unloading, or packing of such products for shipment or in propagating, processing (other than canning), marketing, freezing, curing, storing, or distributing the above products or byproducts thereof..." "(4) any

employee employed in the canning of any kind of fish, shellfish, or other aquatic forms of animal or vegetable life, or any byproduct thereof...." The amendment was rejected by 79 yeas and 196 noes.

Introduced in House on Mar. 8: H. R. 5337 (Kitchin); Mar. 13: H. R. 5537 (Martin of Neb.); Mar. 14: H. R. 5560 (Ayres), H. R. 5561 (Kitchin); Mar. 20: H. R. 5718 (Richman); H. R. 5719 (Robison); Mar. 21: H. R. 5787 (Moore); Mar. 22: H. R. 5819 (Ayres), H. R. 5820 (Kitchin), H. R. 5825 (Goodell), H. R. 5827 (Hemphill), and H. R. 5851 (Gallagher); bills to increase Federal minimum wage; to Committee on Education and Labor.

S. 1457 (McNamara), introduced in Senate Mar. 27, a bill to amend the Fair Labor Standards Act of 1938, as amended, to provide coverage for employees of large enterprises engaged in retail trade or service and of other employers engaged in commerce or in the production of goods for commerce, to increase the minimum wage under the act to \$1.25 an hour, and for other purposes. Bill would raise the minimum wage to \$1.25 an hour for presently-covered workers over a 2-year period. Approximately 4 million additional workers would be covered--beginning at \$1 an hour--and rising to \$1.25 after 3 years. Newly-covered workers would be given overtime protection. For workers in fish processing (33,000): Seafood processing employees are covered for minimum wage but not for overtime (seafood cannery are treated in this way under present law). This means that the exemption in the present law for onshore fishery processing would be cancelled.

To Amend the Fair Labor Standards Act (Hearings before the Special Subcommittee on Labor of the Committee on Education and Labor, House of Representatives, 87th Congress, 1st Session, on H. R. 3935 and various bills regarding minimum wage legislation, February 17, 20, 21, and 24, 1961), 645 pp., printed. Would increase Federal minimum wage to \$1.25 an hour for workers who now have the protection of a dollar minimum. Increase would be in progressive steps, commencing 4 months after the effective date of the enactment over a period of 2 years, starting with \$1.15 the first year, \$1.20 the second year, and \$1.25 the third year. For newly-covered employees the minimum wage would be \$1 the first year, \$1.05 the second year, \$1.15 the third year, and \$1.20 beginning with the fourth year. Contains statements of Government officials, businessmen, industry officials, labor leaders, etc.

H. Rept. No. 75, Fair Labor Standards Amendments of 1961 (March 13, 1961, 87th Congress, 1st Session, Report of the Committee on Education and Labor, to accompany H. R. 3935), 77 pp., printed. Bill would amend the Fair Labor Standards Act of 1938, as amended, to provide coverage for employees of large enterprises engaged in retail trade or service and of other employers engaged in commerce or in the production of goods for commerce, to increase the minimum wage under the act to \$1.25 an hour, and for other purposes. Committee reported bill favorably with amendments. Report presents the background of bill, its purpose, summary of major provisions, changes in coverage and exemptions, and other provisions. Also contains views of minority members of Committee, and other individual views.

NATIONAL AQUARIUM IN THE DISTRICT OF COLUMBIA: H. R. 5890 (Olson), introduced in House Mar. 27, a bill to authorize the Secretary of the Interior to construct a national aquarium in the District

of Columbia; to the Committee on the District of Columbia. Identical to H. R. 111 (Kirwin) and S. 954 (Engle).

NATURAL RESOURCES DEVELOPMENT: H. R. 5513 (Perkins), introduced in House Mar. 13, a bill to stimulate the Nation's economic growth through accelerated natural resources development, and for other purposes. Would accelerate Nation's economic growth by development, conservation, and proper utilization of Nation's land, water, forest, and grass resources to provide adequately for the future needs of Nation's rapidly growing population; by providing Federal aid to States and local organization to effectuate adequate natural resource development.

OCEANOGRAPHIC RESEARCH: S. 1189 (Magnuson), introduced in House on Mar. 2, a bill to amend title 14 of the United States Code in order to authorize the Coast Guard to carry on certain oceanographic research; to Committee on Interstate and Foreign Commerce. Amends title 14 of United States Code, relating to the Coast Guard by inserting at end of chapter 5 a new section: "§ 94. Oceanographic research: The Coast Guard may conduct such oceanographic research, use such equipment or instruments, and collect and analyze such oceanographic data, in cooperation with other agencies of the Government or not, as the Secretary determines to be in the national interest."

On Mar. 15 the Senate Committee on Interstate and Foreign Commerce began hearings on S. 901 to establish a 10-year oceanographic research program and S. 1189 authorizing the Coast Guard to carry on certain oceanographic research.

On March 17, Senate Committee on Interstate and Foreign Commerce continued hearings on S. 901.

Introduced in House on Mar. 27: H. Res. 242 (Keith), H. Res. 245 (Morse), H. Res. 246 (Tupper), H. Res. 247 (Philbin), Resolutions expressing the sense of the House of Representatives with respect to the expansion of oceanographic research; to Committee on Merchant Marine and Fisheries.

OUTDOOR RECREATION RESOURCES REVIEW COMMISSION: On Feb. 27, the Senate Committee on Interior and Insular Affairs ordered favorably reported S. 499, extending until January 31, 1962, the time within which the Outdoor Recreation Resources Review Commission shall submit its final report (S. Rept. 54). On Mar. 3 bill was passed in Senate without amendment.

S. Rept. 54, Extending Time for the Outdoor Recreation Resources Review Commission to Report (report of the Committee on Interior and Insular Affairs to accompany S. 449), 3 pp., printed. Contains purpose and background of bill, and reports of the Chairman of the Outdoor Recreation Resources Review Commission and of the Bureau of the Budget.

S. 449 (in lieu of H. R. 2204), a bill to extend to January 31, 1962, the time in which the Outdoor Recreation Resources Commission shall submit its final report, was passed by the House on March 21 and cleared for President's signature.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT: (Hearings before the Committee on Foreign Relations, United States Senate, 87th Congress, 1st Session on Ex. E, February 14, 15, March 1 and 6, 1961), 320 pp., printed. The purpose of this

treaty is to enable the Western countries to cope more effectively with the economic problems that they all share. These include the continuance of stability and orderly growth of their economies, along with need to devise more productive methods of assisting the less developed countries within a framework that will divide the burden of such efforts more equitably. Contains testimony of Government officials, various industrial associations, and union officials.

POWER PROJECTS FISHERIES RESOURCES: On Mar. 7 a resolution of the House of Representatives of the State of Washington was received in Senate similar to objectives of S. 323 and H. R. 3589, urging the Congress of the United States to enact legislation creating a fish sanctuary of the Salmon River by prohibiting the construction of dams thereon and restricting the height of dams below its mouth on the Snake River to a height no greater than the highest of those dams presently constructed or authorized in that stretch of river, that is, a dam having no more than 100 feet of hydraulic head; to Senate Committee on Interstate and Foreign Commerce. On Mar. 9 a similar resolution was received by Senate.

SALTONSTALL-KENNEDY ACT FUNDS REAPPORTIONMENT: S. 1230 (Gruening and 15 other Senators), introduced in Senate on March 7, a bill to amend the Saltonstall-Kennedy Act so as to establish an additional fund for fishery research programs and fisheries rehabilitation and development projects, and for other purposes; to the Committee on Interstate and Foreign Commerce.

In addition to the 30 percent of gross receipts from duties on fishery products and byproducts now transferred to Secretary of Interior under terms of Saltonstall-Kennedy Act for Federal commercial fisheries research and development, this bill would create an additional fund to be derived from an additional 30 percent of the gross receipts from duties on fishery products to be allocated directly to State agencies having immediate responsibility for management of commercial fishery resources, for fisheries research and development. Would apportion money to States according to a formula based upon the proportion which the value of raw fish landed and the value of manufactured fishery products of each State bears to the total of such items attributable to all the participating States.

Also on March 7, H. R. 5301 (Rivers of Alaska), introduced in House, a bill to amend the act of August 11, 1939, relating to domestically-produced fishery products to establish a fund for the advancement of commercial fisheries; to the Committee on Merchant Marine and Fisheries. Similar to S. 1230.

SMALL BUSINESS: Small Business Exports and the World Market--1960 (Hearings before the Select Committee on Small Business, United States Senate, 86th Congress, 2nd Session, November 17, 1960--New York City, December 6, 1960--New Orleans, La., December 14, 1960--San Francisco, Calif.), 473 pp., illustrated, printed. A series of hearings were held to obtain background for legislation designed to expand opportunities for American small business in world markets. Contains statements of various small businessmen, associations, exporters, etc. Also contains numerous exhibits which help illustrate need for such legislation.

Senate Report No. 51, Eleventh Annual Report of the Select Committee on Small Business, United States Senate, together with supplemental views (February 16,

1961, 87th Congress, 1st Session), 92 pp., printed. Through hearings, investigations, and studies, the Select Committee on Small Business compiled this report which brings into focus the problems of small businessmen. Among others, the report contains articles on Government competition with private business, i.e. competition with private commercial refrigerated warehouses. Also discusses the impact of imports on small business and small business exports and the world market.

STATE DEPARTMENT APPROPRIATIONS: Amendments to the Budget for the Fiscal Year 1962 for the Department of State, H. Doc. No. 115, 87th Congress, 1st Session, a communication from the President of the United States transmitting amendments to the budget for the fiscal year 1962, involving a decrease in the funds for the Department of State. Among the changes shown is one where the original estimate of \$1,959,000 for the International Fisheries Commissions was revised downward to \$1,938,000. The decrease of \$21,000 reprograms the funds between the commissions.

SUPPLEMENTAL APPROPRIATIONS: On Mar. 3 H. R. 5188 (Thomas) was reported out by House Committee on Appropriations, a bill making supplemental appropriations for the fiscal year ending June 30, 1961, and for other purposes (H. Rept. No. 52); and submitted to the Committee of the Whole House on the State of the Union.

The bill provides for Bureau of Sport Fisheries--\$663,000 for management and investigation of resources; \$200,000 for construction (\$14,000 less than requested). Supplemental amounts approved are necessary to cover cost of pay increases, fire-suppression costs, and hurricane damage.

The bill provides for Bureau of Commercial Fisheries--\$235,000 for management and investigation of resources; \$29,000 for administration of Pribilof Islands; \$24,000 for general administrative expenses; and the balance to cover costs of pay increases.

The Department of State appropriations provide \$21,000 for international fisheries commissions for increased pay costs.

On Mar. 7 by a voice vote the House passed H. R. 5188.

H. Rept. No. 52, **Third Supplemental Appropriation Bill, 1961** (Mar. 3, 1961, 87th Congress, 1st Session, report of the Committee on Appropriations to accompany H. R. 5188), 19 pp., printed. Contains summary of bill and Committee recommendations. Includes additional funds for a number of agencies and departments. Also includes table of comparative statement of budget estimates and amounts recommended in the bill.

Third Supplemental Appropriation Bill, 1961 (Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives, 87th Congress, 1st Session), 689 pp., printed. Contains increases in budget estimates and testimony presented by witnesses and representatives of various agencies and departments.

An executive communication received in Senate March 14; to Committee on Appropriations. The proposed additional supplemental appropriations are to provide among other things, an additional amount of funds for Bureau of Commercial Fisheries--"Management and

investigations of resources, \$1,000,000." These additional funds are to finance an emergency research program for Alaska salmon. The large run of red salmon to Bristol Bay in 1960 showed that present management measures under International Convention for the High-Seas Fisheries of the North Pacific Ocean are succeeding more rapidly than had been anticipated, raising the urgent problem of demonstrating that runs are, or will in the near future, be fully utilized under a complete scientific management program for this fishery. On Mar. 20 the Senate Committee on Appropriations continued hearings and heard testimony of the Assistant Director, Bureau of Commercial Fisheries, on funds for research in North Pacific Fisheries.

On Mar. 21 the Senate Committee on Appropriations concluded hearings on H. R. 5188. Committee met in executive session on Mar. 23 to mark up bill and Committee reported favorably with amendments H. R. 5188. On Mar. 24 the Committee reported the bill to the Senate (S. Rept. 85).

An amendment was added to provide an additional sum of \$1,000,000 for the Bureau of Commercial Fisheries. H. R. 5188 was passed by Senate on Mar. 27. The Senate insisted on its amendments and requested a conference with House. On Mar. 28 the House disagreed to Senate amendments, agreed to conference asked by Senate, and appointed conferees.

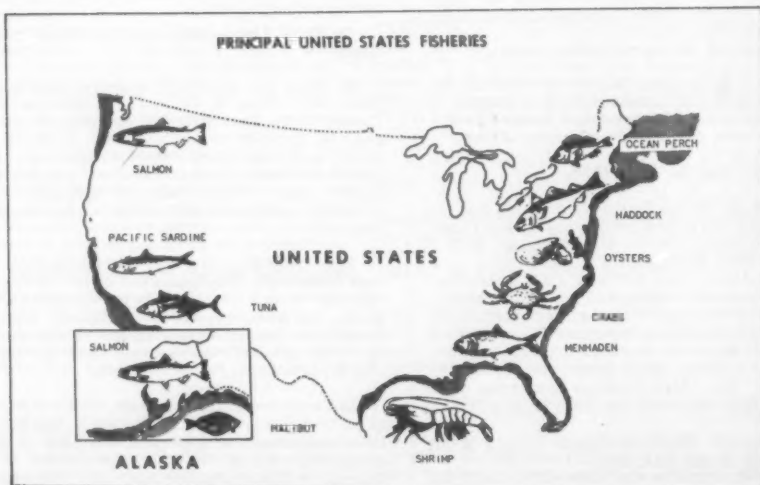
S. Rept. 85, Third Supplemental Appropriation Bill, 1961 (Mar. 24, 1961, 87th Congress, 1st Session, report from the Committee on Appropriations to accompany H. R. 5188), 43 pp., printed. The Committee reported bill to Senate with various amendments and this

report contains information relative to the changes made. For the Bureau of Commercial Fisheries the committee recommended sum of \$1,000,000 which was requested but not considered by House. This sum is for emergency research program for Alaska Salmon. Contains summary of bill, funds for various agencies and departments, and explanation for increases.

TARIFF NEGOTIATIONS: On Feb. 27: H. Con. Res. 172 (Ashmore), H. Con. Res. 173 (Huddleston), H. Con. Res. 174 (Mrs. Kee), H. Con. Res. 175 (King of Utah), H. Con. Res. 176 (Knox), H. Con. Res. 180 (Siler); Feb. 28: H. Con. Res. 181 (Bray), H. Con. Res. 182 (Goodell); Mar. 28: H. Con. Res. 190 (Daniels), H. Con. Res. 193 (Young), Mar. 9: H. Con. Res. 194 (Collier); Mar. 15: H. Con. Res. 196 (Hemphill), concurrent resolutions declaring the sense of the Congress that no further reductions in tariffs be made during the life of the present Reciprocal Trade Agreements; referred to Committee on Ways and Means.

WATER POLLUTION CONTROL: On Feb. 15: H. R. 4304 (Buckley), H. R. 4334 (McFall); Feb. 17: H. R. 4547 (Olsen); Feb. 20: H. R. 4626 (Roosevelt); Feb. 28: H. R. 5046 (Thompson of La.); Mar. 6: H. R. 5208 (Lesinski); Mar. 9: H. R. 5450 (Bailey); introduced in House, bills to amend the Federal Water Pollution Control Act to provide a more effective program of water pollution control; to Committee on Public Works. All similar to H. R. 4036.

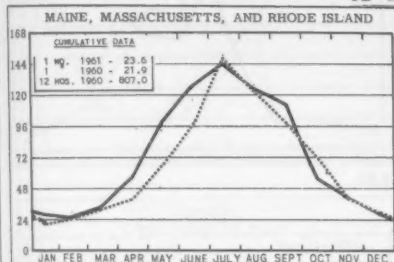
On Mar. 14, the Committee began hearings on H. R. 4036, and related bills. Public witnesses were heard. On Mar. 16 the Committee adjourned hearings subject to call of the Chair.



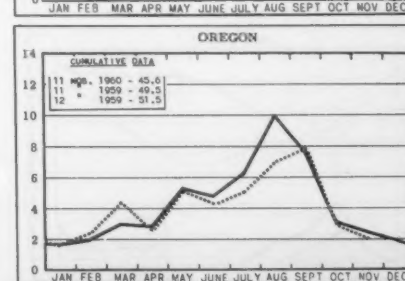
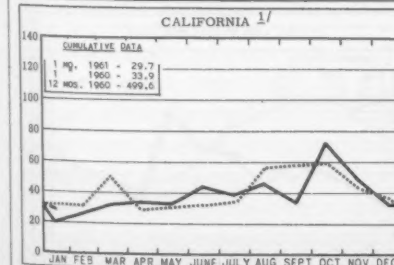
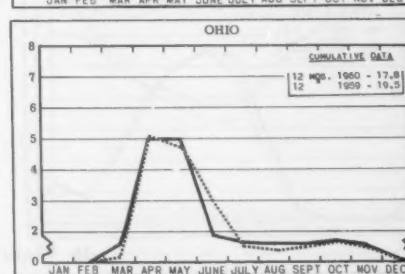
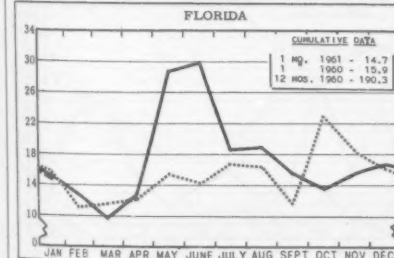
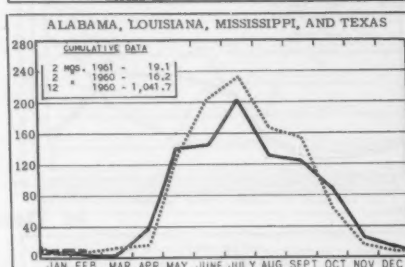
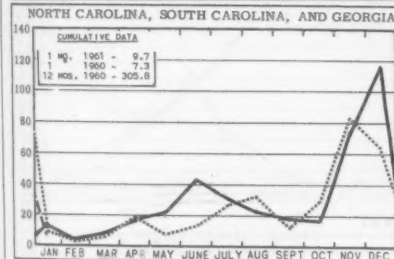
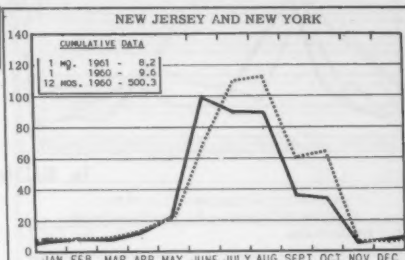
FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds



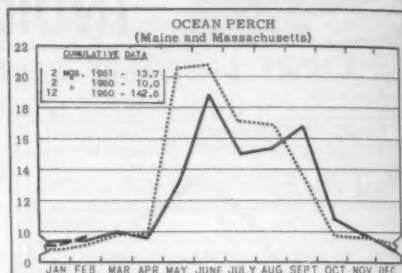
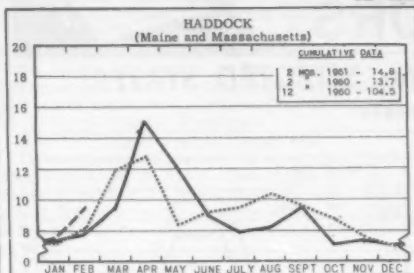
LEGEND:
 — 1961
 1960
 - - - - 1959



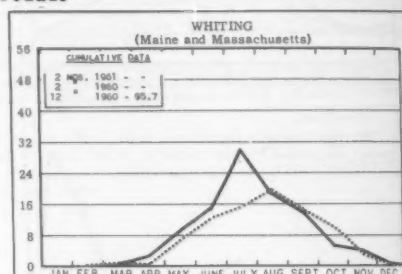
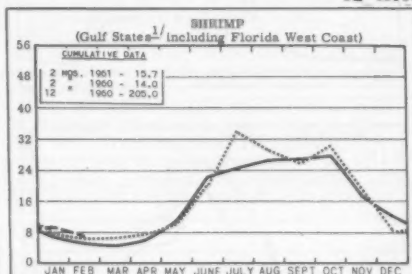
1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

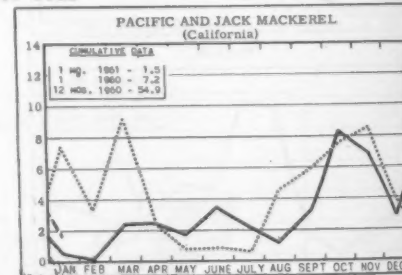
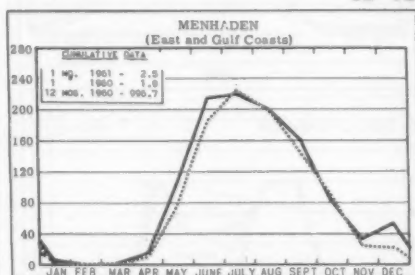


In Millions of Pounds



^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

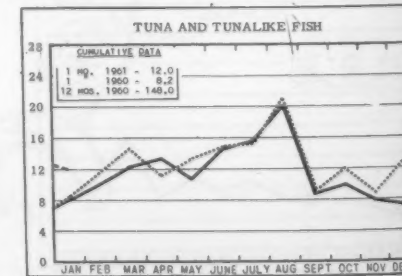
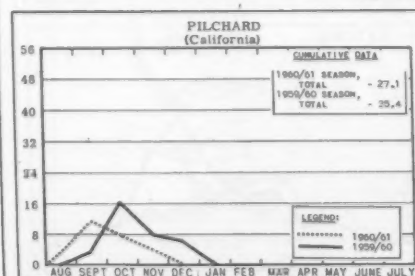
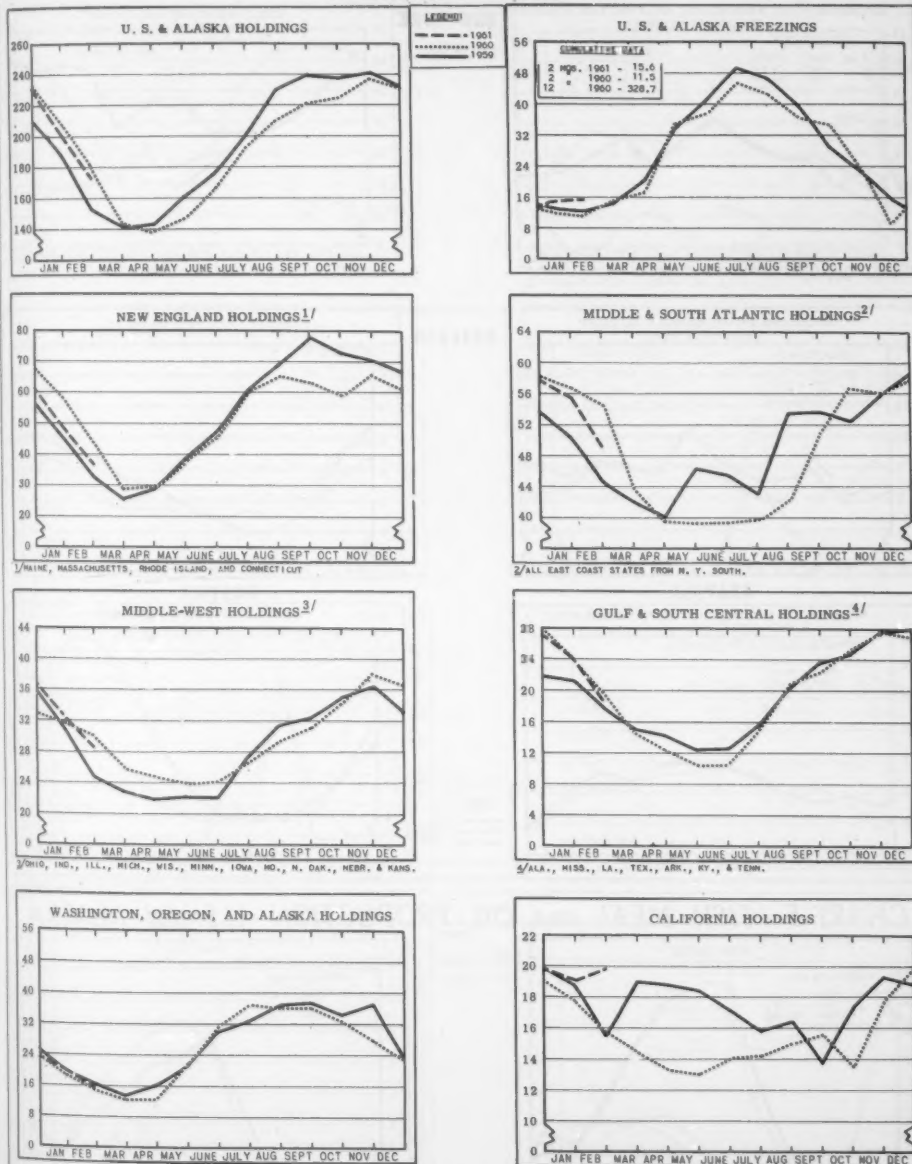


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

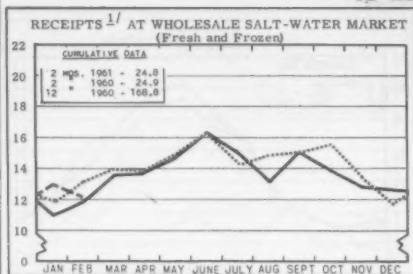
In Millions of Pounds



* Excludes salted, cured, and smoked products.

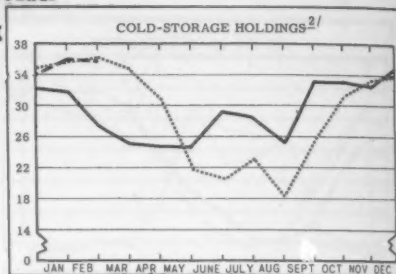
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

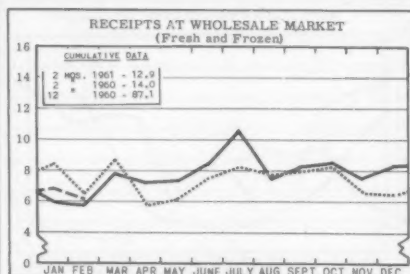


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

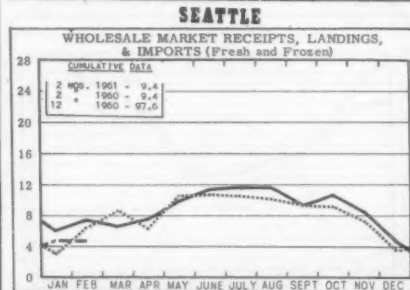
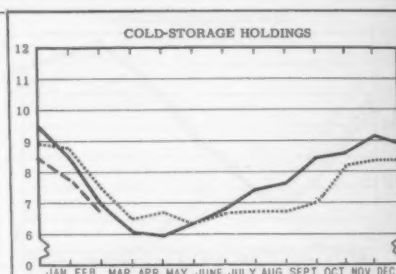
NEW YORK CITY



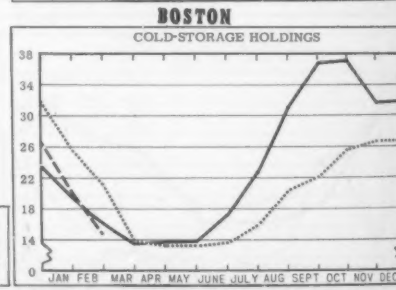
^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



BOSTON



LEGEND:
 — 1961
 - - - 1960
 . . . 1959

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

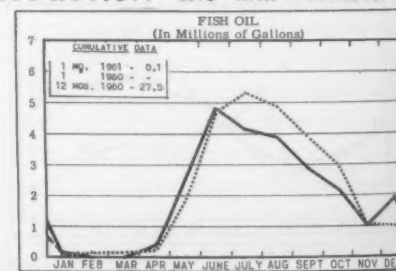
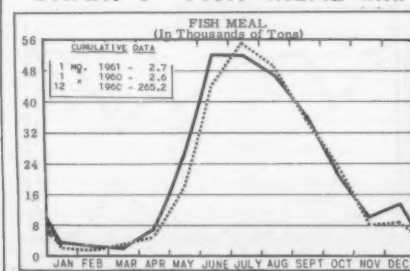
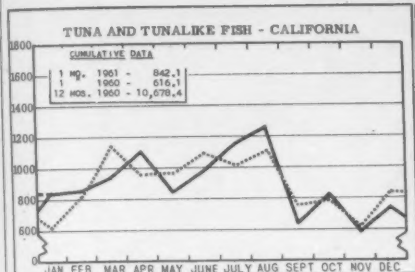
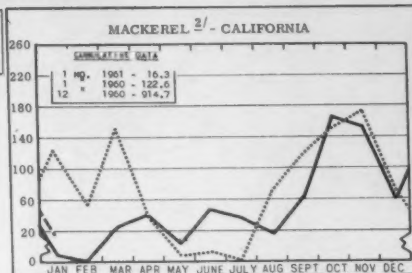
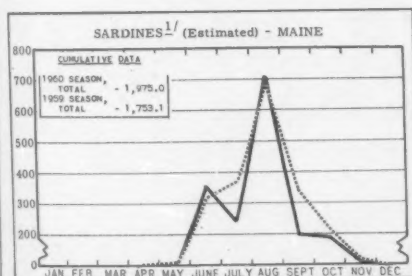
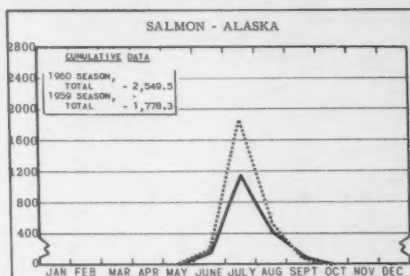
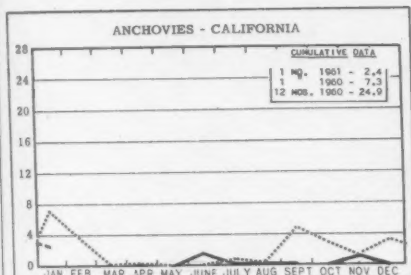


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases

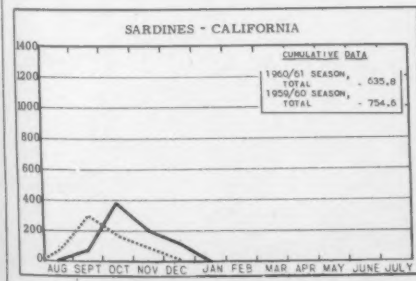


LEGEND:
— 1961
..... 1960
- - - 1959

^{2/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.^{1/} INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES....	100	$\frac{1}{4}$ drawn	3 $\frac{3}{4}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.



LEGEND:
..... 1960/61
— 1959/60

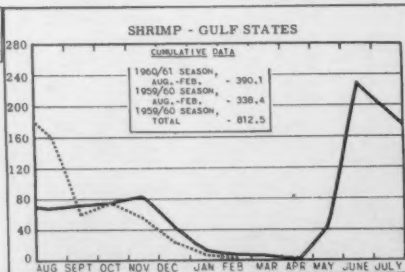
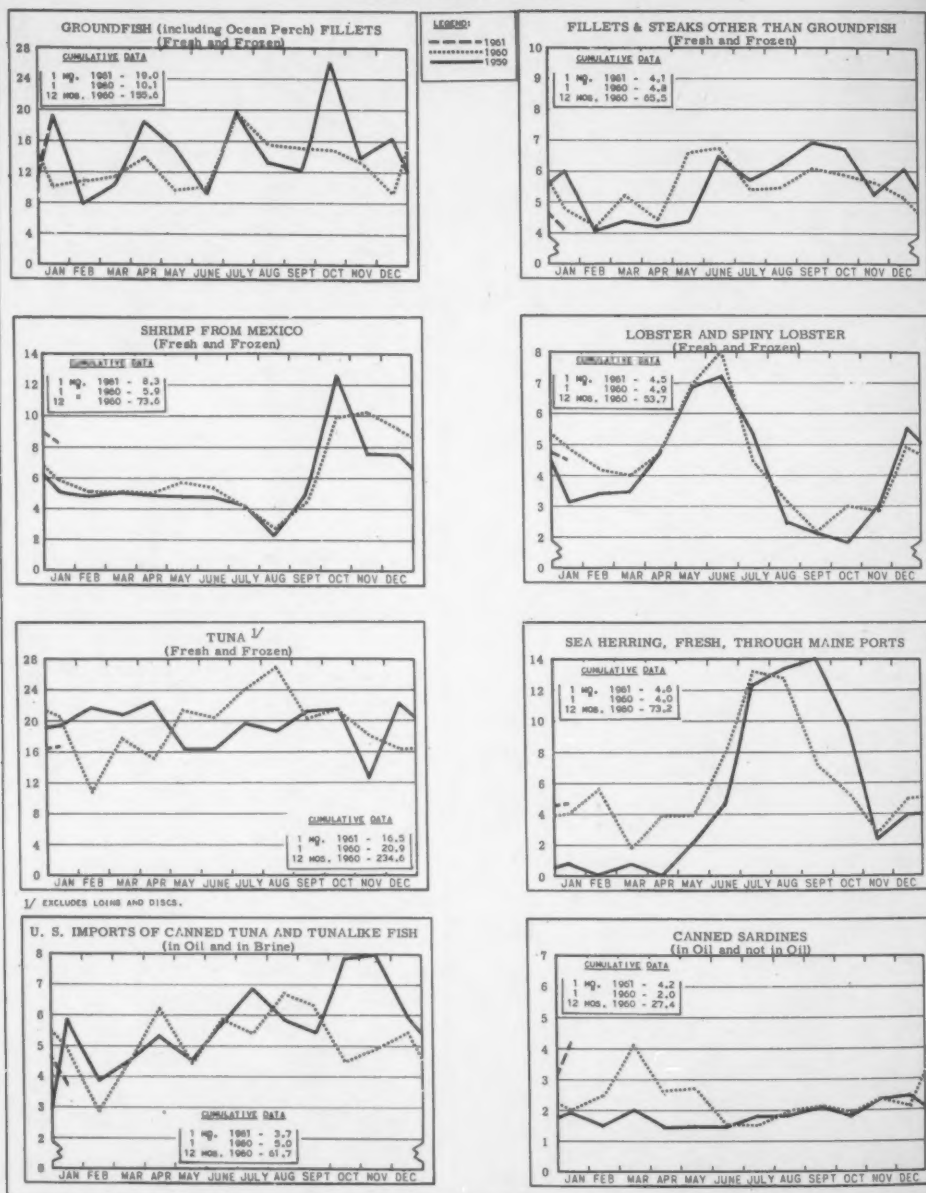


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
SEP.-SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-2441	- Pacific Coast States Fisheries, 1959 Annual Summary, 6 pp.
CFS-2445	- Massachusetts Landings, September 1960, 5 pp.
CFS-2454	- Great Lakes Fisheries, 1959 Annual Summary, 12 pp.
CFS-2458	- New York Landings, October 1960 (Revised), 4 pp.
CFS-2460	- Texas Landings, September 1960, 3 pp.
CFS-2462	- North Carolina Landings, November 1960, 3 pp.
CFS-2463	- Maryland Landings, November 1960, 3 pp.
CFS-2466	- South Carolina Landings, November 1960, 3 pp.
CFS-2468	- Fisheries of the United States, 1959 Annual Summary, 16 pp.
CFS-2470	- Georgia Landings, November 1960, 2 pp.
CFS-2472	- Shrimp Landings, September 1960, 6 pp.
CFS-2473	- Frozen Fish Report, December 1960, 8 pp.
CFS-2474	- California Landings, August 1960, 4 pp.
CFS-2475	- California Landings, September 1960, 4 pp.
CFS-2476	- Rhode Island Landings, November 1960, 3 pp.
CFS-2477	- Florida Landings, November 1960, 7 pp.
CFS-2479	- Mississippi Landings, September 1960, 2 pp.
CFS-2480	- New York Landings, November 1960, 4 pp.
CFS-2481	- Shrimp Landings, October 1960, 6 pp.
CFS-2483	- Mississippi Landings, October 1960, 2 pp.
CFS-2484	- North Carolina Landings, December 1960, 4 pp.
CFS-2486	- New York Landings, December 1960, 4 pp.
CFS-2487	- South Carolina Landings, December 1960, 2 pp.
CFS-2488	- Maine Landings, November 1960, 3 pp.
CFS-2489	- Texas Landings, October 1960, 3 pp.
CFS-2490	- Alabama Landings, October 1960, 2 pp.
CFS-2491	- Maryland Landings, December 1960, 3 pp.
CFS-2492	- Virginia Landings, November 1960, 3 pp.
CFS-2493	- Fish Meal and Oil, December 1960, 2 pp.
CFS-2494	- Alabama Landings, November 1960, 2 pp.
CFS-2496	- Mississippi Landings, November 1960, 2 pp.
CFS-2498	- Alabama Landings, December 1960, 2 pp.
CFS-2499	- Louisiana Landings, May 1960, 2 pp.

CFS-2500 - Louisiana Landings, June 1960, 2 pp.
CFS-2501 - Louisiana Landings, July 1960, 2 pp.
CFS-2502 - New Jersey Landings, December 1960, 4 pp.
CFS-2503 - Ohio Landings, November 1960, 4 pp.
CFS-2504 - Ohio Landings, December 1960, 2 pp.
CFS-2505 - Florida Landings, December 1960, 7 pp.
CFS-2509 - Georgia Landings, December 1960, 2 pp.
CFS-2510 - California Landings, October 1960, 4 pp.
CFS-2513 - Virginia Landings, December 1960, 3 pp.
CFS-2517 - Rhode Island Landings, December 1960, 3 pp.

SSR-Fish. No. 364 - Salmon Runs - Upper Columbia River, 1956-57, by R. R. French and R. J. Wahle, 18 pp., illus., October 1960.

SSR-Fish. No. 366 - Physical and Chemical Data for Bottom Sediments South Atlantic Coast of the United States, M/V Theodore N. Gill Cruises 1-9, by Joseph E. Moore and Donn S. Gorsline, 87 pp., illus., October 1960.

Sep. No. 614 - Air-Curtain Fishing for Maine Sardines..

Sep. No. 615 - A Practical Chemical Method for Killing Mussels and Other Oyster Competitors.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-13	- Indian Fisheries Report, 1959.
MNL-42	- The Shrimp Industry of Panama.
MNL-43	- The Swedish Shrimp Industry.
MNL-44	- Icelandic Fisheries, 1959.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

The Influence of Predation on Numbers of Young Salmon, by R. S. Semko, Translation Series No. 24, 2 pp., processed, March 30, 1959. (Translated from Trudy Problemykh i Tematicheskikh Soveshchaniy ZIN, vol. 6, 1956, pp. 148-149.)

The Possible Cause of Diagonal Slashes of the North Pacific Salmon, by Osamu Sano, Translation Series No. 27, 7 pp., illus., processed, December 8, 1959. (Translated from Hokkaido Provincial Fisheries Research Laboratory, Monthly Report, vol. 16, no. 9, September 1959, pp. 348-350.)

On the Recording Equipment Taking a Count of Salmon-Number by the Utilization of Photoelectric Cell (Preliminary Note), by Toshio Suetake, Translation Series No. 28, 17 pp., illus., processed, December 21, 1959. (Translated from Scientific Reports of the Hokkaido Fish Hatchery, vol. 10, no. 1, 2, December 1955, pp. 73-81.)

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE NOT FOR GENERAL DISTRIBUTION BUT ARE AVAILABLE FOR REFERENCE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

On the Food Habits of Yellowfin Tuna NEOTHUNNUS MACROPTERUS (Schlegel) from the Celebes Sea, by Hiroshi Nakamura, Translation No. 17, 9 pp., illus., processed, August 26, 1949. (Translated from Transactions of the Natural History Society of Formosa, vol. 26, no. 148, January 1936.)

An Outline of Studies of the Plecostei (Tuna and Skipjack) in 1925, by Kamakichi Kishinouye, Translation No. 18, 8 pp., processed, August 29, 1949. (Translated from Suisan Gakkai Ho, vol. 4, no. 3, April 1926, pp. 125-137.)

A Study of the Mackerels, Cybiids, and Tunas, by Kamakichi Kishinouye, Translation No. 25, 15 pp., processed, September 9, 1949. (Translated from Suisan Gakkai Ho, vol. 1, no. 1, May 1915, pp. 1-24.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIAL OFFICE MENTIONED:

California Fishery Products Monthly Summary, Part I--Fishery Products Production and Market Data, December 1960 and January 1961; 17 pp. and 13 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish, mackerel, anchovies, and sardines; pack of canned tuna, mackerel, anchovies, and sardines; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna Boat Association auction sales; for the months indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, January 1961, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, November and December 1960; January 1961, 8 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, January 1961, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, January 1961, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole); Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for November and December, 1960, 19 and 17 pp. respectively. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the months indicated.

Production of Fishery Products in Selected Areas of Alabama, Florida, Louisiana, Mississippi, and Texas 1959, by Peter Di Marco, 39 pp., processed, February 1961. (Available free from the U. S. Fish and Wildlife Service, 609-611 Federal Bldg., 600 South St., New Orleans, La.) Part I reports on trends and conditions in Gulf Coast fisheries during 1959 and gives a resume of the individual fisheries. For the shrimp fishery, a detailed account is presented of total landings by states, extent of coverage of landings, composition of shrimp landings by species and sizes, prices, canning, imports, cold-storage stocks, and general trends and developments. Discusses production and market conditions for the oyster and blue crab fisheries, as well as imports of fresh and frozen fish and shellfish. Part II includes shrimp closed seasons in effect in the Gulf States during 1959, minimum shrimp size regulations, conversion factors and container capacities, and shrimp sizes. The second part also contains statistical tables showing total fishery products landings; fishery imports through the New Orleans Customs District and Port Isabel and Brownsville, Tex.; and LCL express shipments from New Orleans for 1959 by months and destination. Also includes tables showing monthly range of wholesale prices of fishery products on the New Orleans French Market; Gulf States weekly oyster and shrimp packs, 1958/59 season and packs for season 1954-59; summary of Gulf shrimp landings for selected areas, 1958-59 and 5-year averages; and fishery products market classifications in the Gulf area.

Receipts of Fresh and Frozen Fishery Products at Baltimore's Wholesale Fish Market, 1959, by William N. Kelly and James A. Coyne, 42 pp., processed, 1961. (Available free from the U. S. Fish and Wildlife Service, Market News Service, 400 E. Lombard St., Baltimore 2, Md.) The first part discusses the background of the fishery industry; highlights of the wholesale market; and receipts of crab meat, hard crabs, oysters, and striped bass. Also discussed are scup, hake, shad, and butterfish receipts. The second part contains statistical tables showing receipts of fresh and frozen fishery products during 1959, and data on the fresh finfish and shellfish prices, 1959.

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, January 1961, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON, 25, D. C.

"The Effect of Controlled Light on the Maturation of Adult Blueback Salmon," by B. D. Combs, R. E. Burrows, and R. G. Bigej, article, *Progressive Fish-Culturist*, vol. 21, no. 2, 1959, pp. 63-69, processed.

Growth of Bluefin Tuna of the Western North Atlantic, by Frank J. Mather III and Howard A. Schuck, *Fishery Bulletin* 179 (from *Fishery Bulletin of the Fish and Wildlife Service*, vol. 61), pp. 39-52, illus., printed, 20 cents, 1960.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ABALONE:

"On the Formation of the Annual Ring on the Shell of Abalone, *Haliotis discus var hannai* Ino," by Seiichi Sakai, article, *The Tohoku Journal of Agricultural Research*, vol. 11, no. 3, October 1960, pp. 239-244, illus., printed. The Faculty of Agriculture, Tohoku University, Sendai, Japan.

Review of the Abalone in California, by Keith W. Cox, 28 pp., illus., printed. (Reprinted from *California Fish and Game*, vol. 46, no. 4, October 1960, pp. 381-406.) Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif.

AMINO ACIDS:

"Amino Acid Composition of Shellfish Proteins," by Shoji Konosu and Takajiro Mori, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 25, June 1959, pp. 153-155, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

ANIMAL SOUNDS:

Animal Sounds and Communications, Edited by W. E. Lanyon and W. M. Tavolga, Publication No. 7, 456 pp.,

printed, illus., plus a 12-inch long-playing record, \$9.50 (\$8.50 to AIBS Members). American Institute of Biological Sciences, 2000 P St. NW., Washington 6, D. C., 1960. The publication of the proceedings of a Symposium held at the American Institute of Biological Sciences meetings at Bloomington, Ind., in September 1958, under the joint auspices of the Institute, the Ecological Society of America, and the American Society of Zoologists, with support from the Office of Naval Research. It reports significant progress on a new frontier--animal sounds and communication. During the actual symposium, the time allotted to each speaker was necessarily short. In the present volume, the coverage was expanded in two ways. First, the contributing authors were asked to submit papers of a length which they deemed adequate to develop their data and conclusions. Second, two additional chapters were solicited on material not represented at the original symposium: a paper on recording techniques; a chapter on the vocalizations of reptiles and amphibians.

Birds have their songs, frogs and toads their own method of communication, and insects and fish their own set of sounds. The book brings out that these sounds are a part of the animal's behavioral responses to his environment, his inner state, and his associates, and that is why they are being studied. They are communications, and they are being scientifically studied as such. The introduction of the book aptly points out: "A cricket chirps, a dog barks, a thrush sings; sounds older than man, sounds pleasing to the ear, often complex in structure, each distinctive, each stereotyped... Nearly all of us must have stopped at one time or another to ask ourselves: what do they mean? what do they express? what do they accomplish? why do they exist? and why have they evolved to their present complex and improbable forms?" Although technical in nature, the papers that make up this book can readily be followed by the layman. The introduction points out that to the naturalist perhaps the most striking feature of animal sounds or signals is specificity on a background of tremendous sonant diversity. Every species has its own distinctive signals and some have a considerable repertoire of calls, each corresponding to a particular environmental situation or context.

The study of communication in animals has made great strides in recent years, according to the book. One basic problem has been the absence of any uniform system for describing and classifying animal sounds. Then the introduction states: "Many workers have emphasized the value of descriptive characterization in terms of pitch, timbre, duration, inflexion, and the repetitive or rhythmic patterns of multi-unit phrases and songs. This system has the great advantage of relative objectivity and recently has achieved exciting new potentialities with the development of sensitive recording and analyzing instruments. The sound spectrograms obtained from these instruments constitute an accurate and objective representation of most of the pertinent physical characteristics of sound patterns in a form that can be stored as a permanent record. The significance of this development for the future of communication research is hard to overestimate; like photography and printing, it offers a means of capturing and preserving data which previously remained elusive and ephemeral."

Of the nine papers presented, several are concerned with bird songs. One paper with graphs and rec-

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ordings analyzes the characteristics in detail of selected songs, the variations within the species and even for the same individual, and characteristic differences between species. Another paper demonstrates with respect to the development of vocalization in birds, the promising results to be achieved by a combination of observational and experimental procedures. Still another paper deals with bird songs and mate selection.

The chapter "Sound Production and Underwater Communication in Fishes" is quite fascinating and offers a new look into the unknown world of sound production and communicating among fish. The chapter also points out: the fact that fish make sounds and also have excellent hearing has been known for a long time. Equally as interesting is the chapter on "The Influence of Sound on the Behavior of Amphibians and Reptiles." Also there is the chapter, "Sound Communication in Orthoptera and Cicadidae," which discusses sound communications in two orders of insects. The two final papers of the nine deal with the broader aspects of the studies: "An Ecological and Functional Classification of Animal Sounds," and "Logical Considerations in the Study of Animal Communication."

The standard 12-inch long-playing record, prepared from tape recordings that accompanied the papers at the Indiana meeting, is included with the book to illustrate the principles discussed in each chapter. It aids in understanding the discussions in the book and in appreciating the findings. The bird songs are first played at normal speed and then at one-fourth speed, enabling the listener to hear the details and characteristics he sees on the graphs. There are also sounds of insects, amphibians, and fish. The sounds of fish should be of particular interest to any one interested in fish in any way, even if the interest is just cursory since it is quite interesting to hear the sounds made by the black grouper, sea catfish, gaff-top sail catfish, and toadfish. Also, the record gives a repertoire of sounds made by different species of frogs.

--Joseph Pilaggi

CALIFORNIA:

California Fish and Game, vol. 47, no. 1, January 1961, 120 pp., illus., printed. Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif. Includes, among others, these articles: "King Salmon Spawning Stocks of the California Central Valley, 1940-1959," by Donald H. Fry, Jr.; "Report on a Co-operative, Preseason Survey of the Fishing Grounds for Albacore (*Thunnus germo*) in the Eastern North Pacific, 1959," by William L. Craig and Joseph J. Graham; "Construction and Operation of a Small Boat Trawling Apparatus," by Wayne J. Baldwin; "The First Recorded Mass Stranding of Pelagic Red Crabs, *Pleuroncodes planipes*, at Monterey Bay, California, Since 1859, with Notes on Their Biology," by Peter W. Glynn; and "The External Morphology of the First Zoal Stages of the Crabs, *Cancer magister* (Dana), *Cancer antennarius* (Stimpson), *Cancer anthonyi* (Rathbun)," by Robert D. Mir.

The Marine Fish Catch of California (For the Year 1959), Fish Bulletin No. 111, 44 pp., illus., printed.

Librarian, California State Fisheries Laboratory, Terminal Island, Calif., 1960. A summary of the 1959 landings of fish, mollusks, and crustaceans in California by commercial fishing vessels or shipped into the State for processing. Statistical data cover annual landings and shipments, 1916-1959; landings and shipments of leading species by pounds and value; licensed commercial fishermen; number of fishing boats by length; origin of shipments; origin of commercial fish landings; and monthly landings and shipments, statewide and by areas. Also included are annual data on quantity and value of landings by areas; value of landings by ports and areas; sport catch, 1950-1959; and live bait catch. Contains a list of common and scientific names of fishes, crustaceans, and mollusks in the 1959 commercial catch.

CANADA:

Fisheries Statistics of Canada, 1959 (British Columbia), 18 pp., illus., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, January 1961. Contains tables giving the quantity and value of fishery products landed in British Columbia in 1944-59, by species and by fisheries districts; quantity and value of manufactured fishery products for 1958-59; capital equipment in the primary fisheries operations, 1958-59; and number of persons engaged in primary fisheries operations, 1958-59.

Fisheries Statistics of Canada, 1959 (Newfoundland), 24 pp., illus., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, January 1961. Presents tables giving the value of fishery products by species, 1955-59; quantity and value of fishery products by species and fisheries areas, 1958-59; capital equipment employed in primary operations by areas, 1958-59; and number of persons engaged in the fisheries by areas, 1958-59.

CANNING:

"Studies on Technical Problems in the Processing of Canned Crab (*Paralithodes camtschatica* Tilesius)," by Eiichi Tanikawa, article, *Memoirs of the Faculty of Fisheries Hokkaido University*, vol. 7, nos. 1 and 2, 1959, pp. 95-155, printed. Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

CAVIAR:

"The Effect of Pasteurization on the Prolongation of the Storing Time of Caviar of the Siberian Salmon," by I. I. Lapshin, article, *Sbornik Nauchnykh Moskovskogo Instituta Narodnogo Khoziaistva*, no. 8, 1956, pp. 148-159, printed in Russian. Moscow Institute of the National Economy, Stremiannyi P., Moscow, U.S.S.R.

CEYLON:

Administration Report of the Director of Fisheries for 1959, 92 pp., printed in Sinhalese and English, Rs. 2.75 (About 60 U. S. cents). Government Publication Bureau, Colombo, Ceylon, November 1960. Progress reports for the year 1959 are presented by the Department of Fisheries. Among the subjects covered are: Colombo plan aid from Canada and other countries; extended technical assistance program of F.A.O.; fishing disputes and regulations; enforcement work; economic assistance to fishermen; fishermen's cooperative societies; and loans

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to individuals and groups of fishermen. Also discussed are: coastal navigation aids; fisheries extension service; fresh and brackish water fisheries; pearl fisheries; cooperative fish sales union; and biological and technological research. Statistical data are included on the production of fresh and cured fish, and foreign trade in fishery products and byproducts.

CHEMICAL CONTENT:

"The Folic Acid Content of Fish and Shellfish," by Hideo Higashi and others, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 9, 1959, pp. 776-780, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

"Studies on Folic Acid and Folinic Acid of Fishes," by Daiichi Kakimoto and Akio Kanazawa, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 1, 1959, pp. 933-936, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

CHOLESTEROL:

"Determination of Cholesterol in Fish Meat with Saponin," by Y. Yamazoe, article, Kagaku Kogaku, vol. 30, 1960, pp. 258-259, printed in Japanese. Society of Chemical Engineers, 609 Kojunsha Bldg., 4 Ginza 6-chome, Chuo-ku, Tokyo, Japan.

CLAMS:

"Clam Poison. I--The Paper Chromatographic Purification of Clam Poison Dihydrochloride," by A. A. Casselman and others, article, Canadian Journal of Chemistry, vol. 38, August 1960, pp. 1277-1290, printed. Canadian Journal of Chemistry, National Research Council, Ottawa 2, Canada.

COD:

"Evidence of Cod (Gadus morhua L.) Migrations from the Norway Coast to the Faroese Islands," by M. J. Holden, article, Journal du Conseil, vol. 26, no. 1, December 1960, pp. 68-72, illus., printed. Andr. Fred. Host & Son, Bredgade, Copenhagen, Denmark.

COMMISSIONS:

Gulf States Marine Fisheries Commission Eleventh Annual Report 1959-1960 (to the Congress of the United States and to the Governors and Legislators of Alabama, Florida, Louisiana, Mississippi, and Texas), 36 pp., printed, for limited distribution. Gulf States Marine Fisheries Commission, 312 Audubon Bldg., New Orleans 16, La., 1960. Outlines the Commission's activities for the period October 1959-October 1960, with a summary of some of the points of general interest in the Compact among the 5 Gulf States. Describes briefly the activities of each of those States during the period. Short discussions of the U. S. Fish and Wildlife Service activities in technological and biological research, exploratory fishing in the Gulf area, the Gulf fishery statistical and Market News programs, and other activities are included. Also contains a financial report of the Commission.

CRAYFISH:

"Chromatophorotropins in the Crayfish Orconectes clypeatus and Their Relation to Long-Term Back-

ground Adaptation," by Milton Fingerman, article, Physiological Zoology, vol. 31, 1958, pp. 193-208, printed. Physiological Zoology, University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill.

DEODORIZATION:

"Deodorization of Fishiness by Adding Ginger," by Y. Tomiyasu, M. Toyomizu, and K. Takahashi, article, Eiyo to Shokuryo, vol. 7, 1955, pp. 272-273, printed in Japanese. Eiyo to Shokuryo (Journal of the Japanese Society of Food and Nutrition), Charles E. Tuttle Co., Tokyo, Japan.

DIRECTORIES:

Scandinavian Fishing Year-Book, 1960-61 (The European Fishing Handbook), edited by Jorgen Frimodt, 487 pp., illus., printed. Jorgen Frimodt, 25, Strandgade, Copenhagen K, Denmark. A useful handbook for the international fisheries trade. Contains chapters on the world catch and production of fish and shellfish, European fishing in the Atlantic, and fish names in various languages together with their scientific names. Sections on Denmark, Faroe Islands, Norway, Sweden, Finland, Iceland, Germany, Netherlands, Belgium, and United Kingdom contain articles on catch statistics, addresses of foreign representatives, names of importing and exporting firms, lists of builders and repair yards for fishing craft, and other trade data. Included are lists of importers and exporters of fishery products throughout the world. The appendix contains a list of port-distinguishing letters of fishing vessels and a directory of individual vessels under registry of the above-mentioned countries.

DOGFISH:

"Osmotic Pressure and Aqueous Humor Formation in Dogfish," by Russel F. Doolittle, Cynthia Thomas, and William Stone, Jr., article, Science, vol. 132, July 1960, pp. 36-37, printed. Science, American Association for the Advancement of Science, 1515 Massachusetts Ave., NW, Washington 5, D. C.

ELECTRICAL FISHING:

"Refinements of Equipment and Procedures in Electrofishing," by Arthur Witt, Jr. and Robert S. Campbell, article, Transactions of the American Fisheries Society, vol. 88, no. 1, 1959, pp. 33-35, printed. Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

ENZYMES:

"The Enzyme 5-Phosphorylribose Pyrophosphokinase in Fish Muscle," by H.L.A. Tarr, article, Canadian Journal of Biochemistry and Physiology, vol. 38, July 1960, pp. 683-691, printed. Canadian Journal of Biochemistry and Physiology, Division of Administration, The National Research Council, Sussex St., Ottawa, Canada.

EUROPE:

"Evolution Probable des Industries de la Pêche en Europe dans les Vingt Années qui Viennent" (Probable Development of the European Fishery Industries in the Next 20 Years), by M.B.F. Ranken, article, La Pêche Maritime, vol. 39, no. 993, December 1960, pp. 807-817, illus., printed in French. La Pêche Maritime, 190, Blvd. Haussmann, Paris (8^e), France.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

FISH BEHAVIOR:

"Differences on the Frequency of Fishes Among Several Kinds of Colours for Under-Water Fencing Net," by Y. Hiyama, T. Kusaka, and K. Kondo, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 22, no. 10, 1957, pp. 596-601, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

"Differences on the Frequency of Transfer of Fishes with Different Degrees of Inclinations of Under-Water Fencing Net," by Y. Hiyama, T. Kusaka, and K. Kondo, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 22, no. 10, 1957, pp. 602-604, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

"Effect of Supersonic Wave on Behavior of Fish," by Chosei Yoshimuta and Shinsuke Mitsugi, article, Bulletin of the Tokai Regional Fisheries Research Laboratory, no. 13, 1956, pp. 51-60, printed in Japanese with English abstract. Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan.

"Fundamental Studies on the Relation of Underwater Sound to the Fish Behaviour. I--About the Sounds by Dropping or Showering," by Michio Chuman, article, Memoirs of the Faculty of Fisheries, Kagoshima University, no. 4, 1955, pp. 61-64, printed in Japanese with English abstract. Faculty of Fisheries, Kagoshima University, Kagoshima, Japan.

"Movement of the Fish in Response to Sound Stimuli with Reference to Sound Intensity," by Y. Suyehiro, S. Yoshino, and Y. Tsukamoto, article, Japanese Journal of Ichthyology, vol. 6, no. 4/6, 1957, pp. 136-140, printed. Japanese Association for the Promotion of Ichthyology, Tsukiji 5-chome, 1-banchi Kyobashi, Tokyo, Japan.

"The Restricted Movement of Fish Populations," by Shelby D. Gerking, article, Biological Reviews, vol. 34, no. 2, 1959, pp. 221-242, printed. Biological Reviews of the Cambridge Philosophical Society, Cambridge University Press, 200 Euston Rd., London NW1, England.

FISH COOKERY:

"The Change of Digestion Rate of Fish Protein with Different Cooking Methods," by Kinue Ito, article, Kasei-gaku Zasshi, vol. 10, 1959, pp. 171-176, printed in Japanese. Kasei-gaku Zasshi, Charles E. Tuttle Co., Tokyo, Japan.

FISH FLOUR:

"Nutritional Value of Fish Flour Supplements," by V. Chalam Metta, article, Journal of the American Dietetic Association, vol. 37, September 1960, pp. 234-240, printed. American Dietetic Association, 620 North Michigan Ave., Chicago 11, Ill.

FISH OILS:

"Dietary Marine Fish Oils and Cholesterol Metabolism. 2--The Effect of Vitamin A and Lingcod Liver Oil Components on the Serum Cholesterol Levels in Chicks," by J. D. Wood, article, Canadian Journal of

Biochemistry and Physiology, vol. 38, August 1960, pp. 879-887, printed. Canadian Journal of Biochemistry and Physiology, Division of Administration, The National Research Council, Sussex St., Ottawa, Canada.

FISH POPULATIONS:

"Dynamical Treatment of Exploitation of Aquatic Resource. II--Effect on the Aspect of Appearance of Recruit by the Feedback of Information of the Size of Stock," by Takeyuki Doi, article, Bulletin of the Tokai Regional Fisheries Research Laboratory, no. 13, 1956, pp. 73-84, printed in Japanese with English summary. Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan.

FISHERY AGREEMENT:

"Fishery Agreement between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the Kingdom of Norway (with Annexes and Exchanges of Letters), Oslo, November 17, 1960, Norway No. 2 (1960), 13 pp., printed, 1s. (about 14 U. S. Cents). Her Majesty's Stationery Office, York House, Kingsway, London WC2, England.

FISHWAY:

"Experiments with a Vertical Baffle Fishway," by Leonard O. Fisk, article, California Fish and Game, vol. 45, no. 2, 1959, pp. 111-122, printed. Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif.

FLORIDA:

Conserving Florida's Marine Resources, 4 pp., illus., printed. Florida State Board of Conservation, Marine Laboratory, St. Petersburg, Fla., March 1960.

FOREIGN TRADE:

Exporting for Profit, by J. Parker Van Zandt, Management Aids for Small Manufacturers No. 121, 4 pp., processed. Small Business Administration, Washington 25, D. C., January 1961. A leaflet outlining steps to be followed in exporting commodities profitably. United States businessmen now have the best opportunity in years to do business abroad. A producer starts by analyzing his most promising foreign markets. He next selects agents to introduce his products abroad. Then he uses the same creative imagination and vigor in promoting his export program as he does in his sales promotion at home. His efforts are encouraged by the Federal Government because his success helps to reduce the U. S. multibillion dollar payment gap and aids in strengthening the economy.

FRANCE:

"Les Problemes de la Commercialisation du Poisson" (Problems in Marketing Fish), by R. Lagarde, article, La Peche Maritime, vol. 39, no. 993, December 1960, pp. 769-775, illus., printed in French. La Peche Maritime, 190, Blvd. Haussmann, Paris (8^e), France.

FRESH-WATER FISH:

"Studies of Tolerance of Certain Freshwater Fishes to Brine Water from Oil Wells," by Robert K. Chipman, article, Ecology, vol. 40, no. 2, 1959, pp. 299-302, printed. Ecological Society of America, Duke University Press, Box 6697, College Station, Durham, N.C.

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GENERAL:

A Biography of the Sea: The Story of the World Ocean, Its Animals and Plant Population, and Its Influence on Human History, by Richard Carrington, 286 pp., illus., printed, \$5. Basic Books, Inc., 59 - 4th Ave., New York 3, N. Y.

Mirovoe Rybolovstvo (World Fisheries), by V. M. Shparlinskii, 132 pp., printed in Russian. Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii (VNIRO), Gosplan SSSR, Moscow, U.S.S.R., 1959.

OEEC: Seefischerei und Aussenhandel mit Fischen und Fischwaren der Assoziierten Gebiete (Sea Fisheries and Foreign Trade in Fish and Fishery Products in Various Nations), by Wilhelm Blanke, 83 pp., processed in German, 10 DM (about US\$2.40), Forschungsstelle für Fischereiwirtschaft im Bremer Ausschuss für Wirtschaftsforschung, Parkstrasse 50, Bremen, Germany, 1960. This study is the third volume of a series concerned with sea fisheries and foreign trade in fish and fishery products in various nations of the world. In this particular work, there is provided the statistical basis for trade between the O.E.E.C. and various nations; in particular, Hong Kong, Ceylon, Aden, and Angola.

"On the Relation Between Water Temperature and the Response for Stimuli. The Investigation to Decide the 'Optimum Temperature,'" by Toshiro Kuroki, article, Memoirs of the Faculty of Fisheries, Kagoshima University, vol. 3, no. 2, 1954, pp. 19-24, printed in Japanese with English summary. Faculty of Fisheries, Kagoshima University, Kagoshima, Japan.

"On the Type of Frequency Curve of the Catch. II," by T. Yoshihara, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 22, no. 10, 1957, pp. 618-620, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

GERMANY:

"L'Industrie des Pêches en République Fédérale Allemande" (The Fisheries Industry in the German Federal Republic), by Rudolph Preisler, article, La Pêche Maritime, vol. 39, no. 993, December 1960, pp. 777-798, illus., printed in French. La Pêche Maritime, 190, Blvd. Haussmann, Paris (8^e), France.

"La Nouvelle Halle à Poisson de Cuxhaven" (Cuxhaven's New Fish Market), article, La Pêche Maritime, vol. 39, no. 993, December 1960, pp. 799-805, illus., printed in French. La Pêche Maritime, 190, Blvd. Haussmann, Paris (8^e), France.

GILL-NETTING:

"Gill-Netting in Nova Scotia," article, Trade News, vol. 13, no. 6, December 1960, pp. 11-13, illus., processed. Information and Educational Service, Department of Fisheries, Ottawa, Canada. Discusses the application of the Great Lakes method of gill-netting to the Nova Scotia groundfish industry. Nova Scotia's Director of Fisheries originated this unique idea and secured the services of a veteran Lake Erie net expert for instructing fishermen in the net-hanging technique used on the Great Lakes. Long-liners and dragnets were used and power net-lifters were

installed. Labor-saving advantages and increased catches were soon apparent to fishermen and foretell a reduction in long-lining and hand-lining in the inshore fisheries, according to one enthusiastic user.

GREAT LAKES:

"Variations in the Annual Abundance in Quebec of Fishes Native to the Great Lakes," by Vadim D. Vladikov and G. Beaulieu, article, Naturaliste Canadien, vol. 85, no. 6/7, 1958, pp. 149-156, printed. Naturaliste Canadien, l'Université Laval, Quebec, Canada.

GULF OF MEXICO:

"Role of Estuarine Waters in Gulf Fisheries," by Bernard E. Skud and William B. Wilson, article, Transactions of the Twenty-Fifth North American Wildlife Conference, pp. 320-326, printed. Wildlife Management Institute, Wire Bldg., Washington 5, D. C., 1960.

HERBICIDES:

"Effects of Five Herbicides on Farm Pond Plants and Fish," by Alfred W. Eipper, article, New York Fish and Game Journal, vol. 6, no. 1, 1959, pp. 46-56, printed. Conservation Department, Arcade Bldg., Albany, N. Y.

HERRING:

"Chemical Character of Spoilage Due to Saponification of Mild-Salted Herring," by V. M. Myasoedova and R. A. Savchenko, article, Izvestiia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khoziaistva i Okeanografii, no. 44, 1957, pp. 197-207, printed in Russian. Izvestiia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khoziaistva i Okeanografii, Vladivostok, U.S.S.R.

"A Deoxyribonucleic Acid from Herring Spermatozoa," by Rudolf K. Zahn, article, Zeitschrift für Physiologische Chemie, no. 313, 1959, pp. 87-96, printed in German. Zeitschrift für Physiologische Chemie, Walter de Gruyter & Co., Woyrschstrasse 13, Berlin W35, Germany.

La Pêche Maritime, vol. 40, no. 994, January 1961, 64 pp., illus., printed in French. La Pêche Maritime, 190, Boulevard Haussmann, Paris, France. Contains the following articles on the herring industry: "La Pêche Britannique du Hareng s'Adapte à la Situation Actuelle" (The British Herring Fishery Adapts Itself to Current Conditions); and "L'Industrie Néerlandaise s'Inquiète de la Rarefaction du Hareng" (The Netherlands Industry Becomes Uneasy over the Scarcity of Herring), by J. J. Jilstra and K. H. Postuma.

"Preliminary Results of Tagging Experiments with Herring (*Clupea harengus* L.) in Greenland," by Jorgen Nielsen, article, Journal du Conseil, vol. 26, no. 1, December 1960, pp. 73-79, illus., printed. Andr. Fred. Host & Son, Bredgade, Copenhagen, Denmark.

ICELAND:

Fishing and the Stocks of Fish at Iceland, by J. A. Gulland, Fishery Investigations, series 2, vol. 23, no. 4, 54 pp., illus., printed, 17 s. (about US\$2.40). Ministry of Agriculture, Fisheries and Food,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

London, England, 1961. (For sale by Her Majesty's Stationery Office, York House, Kingsway, London WC2, England.) Reviews the catch statistics of demersal fish at Iceland during the past 50 years. Cod is the most important species, yielding up to nearly half a million tons annually. The present level of fishing has been sufficient to reduce the abundance of the stocks of cod, but this reduction is not great, and increased effort would result in increased catch. Increased catches could also be obtained by increased trawl mesh size to allow the smallest sizes of fish to escape, thus enabling them to grow larger. Plaice and haddock both show much more severe effects of fishing. The other demersal species caught at Iceland are not analyzed in detail but most of them show some effect of fishing.

INDUSTRIAL OPERATIONS:

Boosting Productivity in Small Shops, by John F. Inderdohnen, Technical Aids for Small Manufacturers No. 74, November-December 1960, 4 pp., processed. Small Business Administration, Washington 25, D.C. A leaflet offering leads on boosting productivity in small plants. The importance of superior production facilities such as up-to-date equipment, regular maintenance schedules, and labor-saving devices is stressed. The role of manufacturing operations--efficient plant layout, use of diecastings, production planning, proper inspection and quality control, and control of over-all costs--is discussed. Suitable placement of employees, maintenance of high morale by adequate facilities, and the cultivation of good manager-employee relations are all important. Working conditions which affect productivity directly are orderly production-line layouts, proper lighting, controlled comfort levels, adequate safety programs, and good housekeeping and maintenance.

ISRAEL:

Bamidgeh, vol. 12, no. 3, September 1960, 48 pp., illus., printed in Hebrew and English. Bamidgeh, Joint Agricultural Extension Center, Division of Fisheries, Ministry of Agriculture, Tel Aviv, Israel. Includes, among others, these articles: "Outlook for the Fish Culture Industry," by S. Tal; "Carp Diseases, Their Prevention and Treatment," by S. Sarig; "Effect of Low Temperatures on *Tilapia nilotica* and *Tilapia galilaea*," by A. Yashouv; "Evaluation of Various Food Items in Diet of *T. nilotica*," by A. Yashouv and J. Chervinski; and "A Note on the Sexual Behaviour of *Tilapia nilotica*," by J. Chervinski.

JAPAN:

Annual Report of Catch Statistics on Fishery and Agriculture, 1959, Agriculture Forestry and Fishery Statistics Bulletin 35-46, 427 pp., printed in Japanese and English. Statistics and Survey Division, Ministry of Agriculture and Forestry, Tokyo, Japan, October 1960. Contains statistical information on the 1959 production of marine fisheries--whaling, pelagic fisheries on the high seas, and domestic marine fisheries; culture in shallow seas; inland water fisheries; and culture in inland waters. Also presents data on processing, average market prices of fishery commodities, and estimated value of the catch.

Statistic Tables of Fishing Vessels (as of the End of 1959), General Report No. 12, 211 pp., printed in

Japanese and English. Japanese Fisheries Agency, Tokyo, Japan. An annual report containing data on the various types of Japanese fishing craft, both powered and nonpowered, as obtained by a fishery registration system. According to the report, "vessels in most types of fisheries have decreased in number except those for fixed net fishing, tuna and bonito fishing and whaling, and governmental vessels, which have increased slightly. In spite of the decrease in number, the gross tonnage of vessels, such as pole-and-line and long-line fishing boats, has increased."

LAMPREY:

Notes on the Spawning Habits of the River Lamprey (*Petromyzon fluviatilis*), by L. O. Hagelin, article, *Oikos*, vol. 9, no. 2, 1958, pp. 221-238, printed. Oikos, Ejnar Munksgaard, Copenhagen, Denmark.

"Parasitic Lampreys of the Genus *Ichthyomyzon* in the Rivers of Illinois", by William C. Starrett, William J. Harth, and Philip W. Smith, article, *Copeia*, no. 4, December 30, 1960, pp. 337-346, illus., printed. The American Society of Ichthyologists and Herpetologists, 34th St. and Girard Ave., Philadelphia 4, Pa.

LAW OF THE SEA CONFERENCE:

"The Second Geneva Conference on the Law of the Sea: The Fight for Freedom of the Seas", by Arthur H. Dean, article, *The American Journal of International Law*, vol. 54, no. 4, October 1960, pp. 751-789, printed. The American Society of International Law, Prince and Lemon Sts., Lancaster, Pa. A comprehensive report, by the Chairman of the United States delegation, of the second Conference on the Law of the Sea, held at Geneva, March 17-April 27, 1960, with 87 nations participating. Covers the historical background of the law of the sea, fisheries claims and political disputes, the first Conference, proceedings and achievements of the 1960 Conference, and future freedom and exploration of the seas.

LOUISIANA:

Fish Populations and Aquatic Conditions in Polluted Waters in Louisiana, by James T. Davis, 121 pp., illus., printed. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La., 1960.

"A Survey of the Fishes in the Upper Kisatchie Drainage of West Central Louisiana, 1958", by Charles D. Hancock, Jr. and James E. Sublette, article, *Proceedings of the Louisiana Academy of Science*, vol. 20, 1958, pp. 38-52, printed. Louisiana Academy of Science, Louisiana State University, Baton Rouge, La.

MACKEREL:

La Pêche Maritime, vol. 40, no. 994, January 1961, 84 pp., illus., printed in French. La Pêche Maritime, 190, Boulevard Haussmann, Paris, France. Contains the following articles on the mackerel industry: "Considerations sur l'Evolution de la Pêche du Maquereau" (Aspects of the Development of the Mackerel Fishery), by L. Plouas; "Progresion Continue de la Production de Maquereau a Boulogne" (Mackerel Production at Boulogne Continues to Increase); and "l'Activite de la

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Conserve de Maquereau" (The Status of the Mackerel Canning Industry), by A. de Torquat.

MARINE ALGAE:

Alginate Jellies, by Robert R. Merton and Richard H. McDowell, British Patent No. 828, 350, printed. Her Majesty's Patent Office, 25 Southampton Bldgs., London WC2, England, February 17, 1960.

Marine Algae of the Eastern Tropical and Subtropical Coasts of the Americas, by William Randolph Taylor, 981 pp., illus., printed, \$19.50. University of Michigan Press, Ann Arbor, Mich., 1960.

MARINE TELEOSTS:

"On the Forming Season of Annual Rings (Opaque and Translucent Zones) in the Otoliths of Several Marine Teleosts," by Takaaki Irie, article, Journal of the Faculty of Fisheries and Animal Husbandry, Hiroshima University, vol. 1, no. 3, 1957, pp. 311-319, printed. Faculty of Fisheries and Animal Husbandry, Hiroshima University, Hiroshima, Japan.

MENHADEN:

"Distribution of Menhaden, Genus brevoortia, in the Gulf of Mexico," by J. Y. Christmas and Gordon Gunter, article, Transactions of the American Fisheries Society, vol. 89, no. 4, 1960, pp. 338-343, printed. Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

MISCELLANEOUS:

The National Watercraft Collection, by Howard I. Chapelle, U. S. National Museum Bulletin 219, 327 pp., illus., printed, \$3.50. Smithsonian Institution, Washington, D. C., 1960.

MISSISSIPPI:

Freshwater Fishes in Mississippi, by Fanny A. Cook, 239 pp., illus., printed, \$3. Mississippi Game and Fish Commission, Jackson, Miss., 1959.

MOZAMBIQUE:

Boletim Mensal de Estatística (Monthly Statistical Bulletin), vol. 1, no. 1, July 1960, 40 pp., printed, 10 escudos (about 35 U. S. cents). Direcção dos Serviços de Economia e Estatística Geral, Lourenço Marques, Mozambique. Includes data on fishery products landings and deliveries to the markets.

NEMATODES:

A New Nematode of the Genus CUCULLANUS (Camallanata: Cucullanidae) from a Flounder, PAROPHYRYS VETULUS Girard, 1854, with Notes on the Species from Pleuronectiformes, by L. Margolis, F. R. B. No. 618, 11 pp., illus., printed. (Reprinted from Canadian Journal of Zoology, vol. 38, 1960, pp. 839-849.) Fisheries Research Board of Canada, Biological Station, Nanaimo, Canada.

NETS:

"A Study of the Comparative Efficiency between Nylon and Linen Gill Nets," by Robert J. Muncy, article, Chesapeake Science, vol. 1, no. 2, June 1960, pp. 96-102, illus., printed, 75 cents a single copy. Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md. Field tests were conducted in Chesapeake Bay during the spring of 1959 to compare the differences in the

catches of soft-rayed fish by nylon and linen fiber gill nets. Test nets were matched as closely as possible from commercial net sources and each section was located randomly as to sequence of mesh size and material. Results showed that larger sizes and greater numbers of fish were taken in nylon nets.

"Two Experiments to See the Effect of Mesh Size of Nets on Driving a School of Fish to a Certain Point," by T. Kusaka, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 22, no. 11, 1957, pp. 662-667, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

NORWAY:

Konkyljen, vol. 5, no. 2, December 1960, 31 pp., illus., printed in Norwegian with English summaries. Konkyljen, Stord Marin Industri a.s., Bergen Norway. Contains, among others, the following articles: "Utilizing the Whale," by Kjell Roed; and "Algae and Seaweed," by Dagfinn Omrand.

NUTRITION:

Food Balances in Foreign Countries, Part I--Estimates for 16 Countries of Western Europe, FAS-M-100, 18 pp., October 1960; Part II--Estimates for 12 Countries in the Far East, FAS-M-101, 14 pp., October 1960; Part III--Estimates for 20 Republics of Latin America, FAS-M-104, 22 pp., November 1960; Part IV--Estimates for 28 Countries of Africa and Western Asia; all processed. A series of bulletins giving estimated food balances for some 80 Free World countries in or about the year 1958. The food balance, summarizing in statistical form the food supply situation of a country or area, shows production, import requirements, export availabilities, the utilization of domestically-consumed supplies, and national consumption, both total and average per capita, of individual foods or food groups. Data for fish are included as one among the ten food groups.

NUTRITIVE VALUE:

"Nutritive Value of Fish. II--Biotin, Folic Acid, Pantothenic Acid, and Free Amino Acids of Various Salt-Water Species," by M. E. Loughlin and A. E. Teeri, article, Food Research, vol. 25, July-August 1960, pp. 479-483, printed. Food Research, Department of Food Technology, University of California, Davis, Calif.

OCEANOGRAPHY:

Canadian Oceanographic Research in the Northeast Pacific Ocean, by A. J. Dodimead and J. P. Tully, F.R.B. No. 520, 16 pp., illus., printed. (Reprinted from The Proceedings of the Ninth Pacific Science Congress, 1957, vol. 16, 1958, pp. 180-195.) Fisheries Research Board of Canada, Pacific Oceanographic Group, Nanaimo, Canada.

OCTOPUS:

Kingdom of the Octopus, by Frank W. Lane, 320 pp., illus., printed, \$7.50. Sheridan House, 257-4th Ave., New York 10, N. Y., 1960.

O.E.C.D.:

"The OECD Takes Shape," by G. W. Green, article, Foreign Trade, vol. 115, no. 2, January 28, 1961,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

pp. 5-7, printed. Queen's Printer, Government Printing Bureau, Ottawa, Canada. Covers the evolution of the Organization for Economic Cooperation and Development (OECD) from the Organization for European Economic Cooperation (OEEC). Discusses functions, structure, and scope of OECD.

"U. S., Canada, and Members of OEEC Sign Convention Establishing Organization for Economic Cooperation and Development," article, The Department of State Bulletin, vol. 44, no. 1123, January 2, 1961, pp. 8-15, printed, 25 cents. Office of Public Services, Bureau of Public Affairs, Department of State, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) On December 14, 1960, the United States, Canada and the 18 member nations of the Organization for European Economic Cooperation signed at Paris a convention establishing the Organization for Economic Cooperation and Development, which replaces the OEEC. This article contains statements made by Under Secretary of State Dillon upon his arrival at Paris on December 11 and at the signing ceremony, a communique issued by the OECD ministerial meeting on December 13, and the text of the OECD Convention and supplementary instruments.

OYSTERS:

Pacific Oyster Seed Production (CRASSOSTREA GIGAS), by D. B. Quayle, 5 pp., processed. (Reprinted from Proceedings of the National Shellfisheries Association, vol. 49, 1959, pp. 54-58.) Fisheries Research Board of Canada, Biological Station, Nanaimo, Canada.

"Physiology of the Oyster. II--Mode of Occurrence of Cytochrome in the Oyster," by T. Hoshi, article, Science Reports of the Tohoku University, Fourth Serial, vol. 24, 1956, pp. 131-136, printed. Faculty of Science, Tohoku University, Sendai, Japan.

Prediction of Oyster Setting in British Columbia (CRASSOSTREA GIGAS), by D. B. Quayle, 4 pp., processed. (Reprinted from Proceedings of the National Shellfisheries Association, vol. 49, 1959, pp. 50-53.) Fisheries Research Board of Canada, Biological Station, Nanaimo, Canada.

PARASITES:

The Identity of the Species of LEPEOPHTHEIRUS (Copepoda) Parasitic on Pacific Salmon (Genus ONCORHYNCHUS) and Atlantic Salmon (SALMO SALAR), by L. Margolis, F.R.B. No. 543, 4 pp., printed. (Reprinted from Canadian Journal of Zoology, vol. 36, 1958, pp. 889-892.) Fisheries Research Board of Canada, Biological Station, Nanaimo, Canada.

PERCH:

The Barred Surfperch (AMPHISTICHUS ARGENTEUS Agassiz) in Southern California, by John G. Carlisle, Jr., Jack W. Schott, and Norman J. Abramson, Fish Bulletin No. 109, 76 pp., illus., printed. Librarian, California State Fisheries Laboratory, Terminal Island, Calif., 1960.

PET FOOD:

"From Trash to Treasure," by J. R. Thompson and W. A. Haskell, article, Petfood Industry, vol. 2, no.

12, December 1960, pp. 10-13, illus., printed. Petfood Industry, Garden State Publishing Co., Garden State Bldg., Sea Isle City, N. J. Describes the pet-food fishery of the north central Gulf of Mexico. Discusses the rise of the industry, initiated only eight years ago, to the point where it utilized most of the industrial fish landed in the region in 1959, exclusive of menhaden. This industry has changed the designation of a fishery resource from "trash" to "valuable raw material."

PHILIPPINES:

Fisheries Statistics of the Philippines, 1959, 70 pp., processed. Department of Agriculture and Natural Resources, Bureau of Fisheries, Quezon City, Philippines. A complete report covering all aspects of Philippine fishery production during 1959, with some comparative data for previous years. The tables are grouped together under the headings (1) production, consumption, and requirement; (2) commercial fishing vessels; (3) fish ponds; (4) foreign trade; and (5) other data. Subdivision of the tables is made according to gear, species caught, monthly production, and fishing grounds. The appendices include, among other items, information on the fishery districts, fishing grounds used by commercial fishing vessels, and forms used in collecting fishery statistics. Except for the table which shows fish production data since 1947, most of the information covers the five-year period 1955-59.

PHYSIOLOGY:

"A Study of Visual Perception in Fish, Especially on Resolving Power and Accommodation," by T. Tamura, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 33, no. 9, 1957, pp. 536-557, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

Thermal Requirements of Fish--Three Decades of Study, 1940-1970, by J. R. Brett, 8 pp., illus., printed. (Reprinted from the Transactions of the Second Seminar on Biological Problems in Water Pollution, April 20-24, 1959.) Fisheries Research Board of Canada, Biological Station, Nanaimo, Canada.

POISONOUS FISH:

"Application of the Paralytic Shellfish Poison Assay to Poisonous Fishes," by E. F. McFarren and A. F. Bartsch, article, Journal of the Association of Official Agricultural Chemists, vol. 43, August 1960, pp. 548-554, printed. Association of Official Agricultural Chemists, Box 540, Benjamin Franklin Station, Washington 4, D. C.

Biochemistry and Pharmacology of Compounds Derived from Marine Organisms, by Ross F. Nigrelli, 334 pp., illus., printed, \$5. (Reprinted from New York Academy of Science, Annals, vol. 90, art. 3.) New York Academy of Science, 2 E. 63rd St., New York 21, N. Y.

POLLUTION:

Effects of Pulp and Paper Mill Wastes on the Marine Environment, by Michael Waldichuk, 17 pp., illus., printed. (Reprinted from the Transactions of the Second Seminar on Biological Problems in Water

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Pollution, April 20-24, 1959.) Fisheries Research Board of Canada, Biological Station, Nanaimo, Canada.

"Fission Products and Aquatic Organisms," by W. L. Templeton, paper presented at a Symposium on the Effects of Pollution on Living Material, held by the Institute of Biology in London, September 1958, Institute of Biology, 41 Queen's Gate, London SW1, England, 1958.

PROCESSING:

A Candling Table for the U. K. Fish Processing Industry, 1 p., illus., printed. (Reprinted from Frozen Foods, November 1957.) Frozen Foods, MacLaren House, 131 Great Suffolk St., London SE1, England.

PROTEIN:

"Determination of Tryptophans, Arginine, and Phenylalanine in the Protein of the Mollusks of the Peruvian Coast," by Herminio M. Almendras, article, Anales de la Facultad de Farmacia y Bioquímica, Universidad Nacional Mayor de San Marcos (Lima), vol. 8, 1957, pp. 129-135, printed in Spanish. Universidad Nacional Mayor de San Marcos, Apartado 1760, Lima, Peru.

PURSE SEINING:

"Purse Seining with Lights During 1960," by A. Ben-Tuvia, article, Fishermen's Bulletin, vol. 3, no. 6 (26), December 1960, pp. 21-24, illus., printed in Hebrew with English abstract. Fishermen's Bulletin, P.O.B. 996, Haifa, Israel.

QUALITY:

"Improvement of Quality of Yellowfin by Chlorotetracycline (CTC) Treatment Aboard Ship and CTC Residue of Tissues Before and After Boiling," by Yasuo Yone and Tetsuo Tomiyama, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, January 1960, pp. 49-54, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

"The Picric Acid Turbidity Test: A Possible Practical Freshness Test for Iced Shrimp," by Caroline H. Kurtzman and Donald G. Snyder, article, Food Technology, vol. 14, July 1960, pp. 337-342, printed. Food Technology, The Garrard Press, 510 North Hickory, Champaign, Ill.

"Studies on the Influence of Treatments Immediately after Catching upon the Quality of Fish Flesh. V--Determination of Lactic Acid in Fish Muscle," by Yasuhiko Tsuchiya and Kiyoshi Kuniti, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, March 1960, pp. 284-288, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

RADIOACTIVE WASTES:

Containment of Radioactive Waste for Sea Disposal and Fisheries off the Canadian Pacific Coast, by Michael Waldichuk, F.R.B. No. 630, 21 pp., illus., printed. (Reprinted from Disposal of Radioactive Wastes, pp. 57-77.) Fisheries Research Board of Canada, Biological Station, Nanaimo, Canada.

RADIOACTIVITY:

"Penetration of Radioactive Strontium-90 from the Water into the Body of the Fish," by O. P. Danil'chenko, article, Rybnoe Khoziaistvo, no. 2, February 1958, pp. 28-32, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

RETAILING:

Sales Promotion Pointers for Small Retailers, by Bernard W. Smith, Small Marketers Aids No. 60, December 1960, 4 pp., processed. Small Business Administration, Washington 25, D. C. A pamphlet with pointers on sales promotion for small retailers. The points covered are: determining the sales promotion policy; analyzing the market; deciding what to promote; picking the medium--newspapers, direct mailing, radio, and television; budgeting for the campaign; and planning the schedule for promoting a product.

SALMON:

"Acclimatization of Far-Eastern Salmon in the Basin of the Bering Sea," by M. S. Lazarev, article, Rybnoe Khoziaistvo, no. 2, February 1958, pp. 20-22, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

"Biochemical Studies on Sockeye Salmon during Spawning Migration. VII--Steroid Hormones in Plasma," by D. R. Idler, A. P. Ronald, and P. J. Schmidt, article, Canadian Journal of Biochemistry and Physiology, vol. 37, October 1959, pp. 1227-1238, printed. Canadian Journal of Biochemistry and Physiology, Division of Administration, The National Research Council, Sussex St., Ottawa, Canada.

"Comparative Absorption of Calcium-45 and Strontium-90 by Young Salmon," by N. P. Rudakov, article, Rybnoe Khoziaistvo, no. 4, April 1958, pp. 19-20, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

"The Evolution of the Freshwater Races of the Atlantic Salmon (*Salmo salar* L.) in Eastern North America," by G. Power, article, Arctic, vol. 11, no. 2, 1958, pp. 86-92, printed. Arctic Institute, 3485 University St., Montreal 2, Canada.

Forecast of Bristol Bay Red Salmon Run in 1961, Memorandum No. 1, 21 pp., illus., processed. Commercial Fisheries Division, Alaska Department of Fish and Game, Juneau, Alaska, February 1, 1961. The return of red salmon in 1961 into Bristol Bay rivers is estimated at 22.0 million fish. The forecast was prepared jointly by the Alaska Department of Fish and Game, the U.S. Bureau of Commercial Fisheries, and the Fisheries Research Institute of the University of Washington. The methods of forecast discussed include cycle analysis, smolt and return relationship, early returns of certain year groups, abundance of immature salmon at sea, and oceanographic conditions and weather. The report includes forecasts of the run by rivers and from high-seas operations such as purse-seining and gill-netting. Contains a number of statistical tables presenting data on these topics.

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"On Measures of Increasing the Stock of Far-Eastern Salmon," by K. I. Popov, article, Rybnoe Khoziaistvo, no. 8, August 1958, pp. 9-10, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

"New Data on the Migration of Humpback Salmon in the Sakhalin Region," by P. A. Dvinin, article, Rybnoe Khoziaistvo, no. 1, January 1958, pp. 12-16, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

"The Origin and Speciation of *Oncorhynchus*," by Ferris Neave, article, Transactions of the Royal Society of Canada, sect. 5, ser. 3, 1958, 52-25-39, printed. Royal Society of Canada, National Research Bldg., Ottawa, Canada.

"On Salmon Reproduction," by N. D. Nikiforov, article, Rybnoe Khoziaistvo, no. 5, May 1958, pp. 19-20, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

"Salmon of the River Shannon (1952-56)," by Eileen Twomey, article, Journal du Conseil Permanent International pour l'Exploration de la Mer, vol. 23, no. 1, 1957, pp. 89-96, printed. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark.

"Salmon Studies, 1951," by J. W. Jones, article, Fishery Investigations, ser. 1, vol. 5, no. 6, 1953, pp. 1-16, printed. Ministry of Agriculture and Fisheries, Chester Terrace, Regents Park, London NW1, England.

Some Radiographic Observations on the Gastro-Intestinal and Urinary Systems of Anesthetized Pacific Salmon (*ONCORHYNCHUS*), by Gordon R. Bell and Jack E. Bateman, F.R.B. No. 588, 6 pp., illus., printed. (Reprinted from Canadian Journal of Zoology, vol. 38, 1960, pp. 199-202.) Fisheries Research Board of Canada, Biological Station, Nanaimo, Canada.

(State of Maine) Biennial Report of Atlantic Sea Run Salmon Commission, for Period July 1, 1958 to June 30, 1960, 12 pp., illus., printed. Atlantic Sea Run Salmon Commission, Fisheries Bldg., University of Maine, Orono, Me. Discusses the Narragansett River Research Project, utilization of hatchery-reared Atlantic salmon, and other work of the Atlantic Sea Run Salmon Commission. Also includes statistical tables giving data on the Atlantic salmon stocking program, October 1951 through November 1960.

"The Technique in Catching Baltic Salmon," by S. A. Kalinkin, article, Rybnoe Khoziaistvo, no. 2, February 1958, pp. 43-45, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

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"Effect of the Chemical Composition of Salt on the Salting Process and Quality of Salted Roe," by Ya. V. Mikulich, article, Izvestiia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khoziaistva i Okeanografii, no. 45, 1957, pp. 213-217, printed in Russian. Izvestiia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khoziaistva i Okeanografii, Vladivostok, U.S.S.R.

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La Distribucion Geografica de los Camarones del Noroeste de Mexico, y el Problema de las artes Fijas de Pesca. (The Geographic Distribution of Shrimp of Northwestern Mexico and the Problem of Weir Fishing), by Hector Chapa Saldana, 85 pp., illus., printed in Spanish. Secretaria de Marina, Direccion General de Pesca e Industrias Conexas, Mexico, D. F., 1960. Deals primarily with the distribution of four species of shrimp (*Penaeus vannamei*, *P. stylirostris*, *P. californiensis*, and *P. brevivirostris*) taken by the Mazatlan trawl fleet during the 1953-54 to 1956-57 seasons. Contains maps of the fishing grounds and species distribution for the west coast of Baja California from Punta San Juanico to Cabo Falso and for the mainland from Guaymas to San Blas. An interesting key, based on the coloration of the abdomen of fresh shrimp, is given for identifying the four species.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

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Effect of Water Clarity on Albacore Catches, by G. I. Murphy, 8 pp., illus., printed. (Reprinted from *Limnology and Oceanography*, vol. 4, no. 1, January 1959, pp. 86-93.) *Limnology and Oceanography*, Woods Hole Oceanographic Institution, Woods Hole, Mass.

"Estudos sobre a Biologia dos Atuns em Portugal, 1958-1960," (Studies on the Biology of the Tunas of Portugal, 1958-1960), by H. Vilela, article, *Boletim da Pesca*, vol. 13, no. 69, December 1960, pp. 11-29, illus., printed in Portuguese with English abstract. *Boletim da Pesca*, R. S. Bento, 644, 4.º Esq., Lisbon, Portugal.

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"Progress in Observing Tuna Underwater at Sea," by Donald S. Strasburg and Heeny S. H. Yuen, article, *Journal du Conseil*, vol. 26, no. 1, December 1960, pp. 80-93, illus., printed. Andr. Fred. Host & Son, Bredgade, Copenhagen, Denmark. Equipment for studying tuna behavior underwater on the high seas is described. Starting with a ladder and diver, the staff of the U. S. Bureau of Commercial Fisheries Honolulu Biological Laboratory has progressed to a shielded ladder, an overside caisson, stern and bow blisters, and underwater television. Future plans involve a small, fast submarine. The principal faults and virtues of each device are noted.

UNION OF SOUTH AFRICA:

The South African Fishing Industry Handbook and Buyers' Guide, 1960/61, 217 pp., illus., printed, L 2 2s. (about US\$5.90). Odhams Press, South Africa (Pty.) Ltd., Trust House, Thibault Square, P.O. Box 80, Cape Town, Union of South Africa. The fifth edition of this handbook reviews the progress of the South African and South-West African fishing industry from 1958 to 1960 and gives details of the record catches. Included is information on recent developments in the fishing industry; fish-processing factories; canning industry; legal minimum size limits of South African fish; commercial fish, shellfish, and aquatic flora; and organizations serving the fishing industry. Also included is material on leading personalities in the industry; South and South-West African fishing companies; fishery products; buyers' guide; details of fishing vessels; motor fishing boats; motor and steam trawlers; details of marine engines; and suppliers of fuels and lubricants.

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"Britain's Fishing Industry," article, *British Affairs*, vol. 4, no. 4, December 1960, pp. 198-202, printed. British Information Services, 45 Rockefeller Plaza, New York 20, N. Y. Discusses fishing as one of Britain's major industries, and its development in the twentieth century. It discusses the white fish fleet, herring fishery, international problem of conservation, modernization of vessels, and introduction of quick-freezing processes and factoryships.

Report of the Committee of Inquiry into the Fishing Industry, 181 pp., printed, 8 s. (about US\$1.15).

Her Majesty's Stationery Office, York House, Kingsway, London WC2, England, January 1961. Presents the findings, conclusions, and recommendations of a committee appointed November 27, 1959, to assess, in relation to developments in fishing and the marketing of fish, the size, pattern, and implications of an economic fishing industry in the United Kingdom. This report gives a detailed picture of the fishing industry and its problems, considers whether the industry can be made economic at its present or even a higher level rather than at a lower level, and stresses the need to provide a versatile and flexible fishing fleet. Topics covered include major developments in recent years, fish stocks and fishing grounds, the fishing fleet, officers and crews of fishing vessels, and fish docks and dockside sales at the major ports. Also discussed are the inshore fishing industry; inland distribution; processing; demand, price, and quality; research and development; and organization of the industry.

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The Effect of Regulation of the Flow of the Kura River on the Behaviour and Abundance of Fishes in the Region Below the Mingechaur Hydroelectric Station, by Yu. A. Abdurakhmanov, Translation Series No. 258, 4 pp., processed, 1960. (Translated from *Rybnoe Khoziaistvo*, vol. 34, no. 12, 1958, pp. 13-15.)

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VIETNAM:

Motorization of Fishing Junks in Vietnam, by Robert J. Schoeffler, 33 pp., illus., printed. United States Operations Mission to Vietnam, Saigon, Vietnam, 1960. An illustrated booklet describing the United States Operations Missions program of motorizing Vietnam's 35,000 "bamboo bottom" fishing junks. Included is information on the development of these unique, teredo-resistant, craft; their construction; wind propulsion; problems of motorization; types of motors used; and increased fish catches resulting from motorization. About half of the booklet consists of photos and drawings showing details of construction and operation of the vessels, unloading the catch, and types of fish landed.

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"Selection of Body Site for Scale Samples in the White Perch, *Roccus americanus*," by Romeo J. Mansueti, article, *Chesapeake Science*, vol. 1, no. 2, June 1960, pp. 103-109, illus., printed. Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.



COOKING SARDINES WITH INDIRECT HEAT

In Spain and Portugal, the conventional method of cooking sardines with direct steam heating is being changed to indirect heat. Steam coils are installed inside the lateral walls of the conventional fish cookers. To get a uniform distribution of heat there are fans. By using this method a more even heating is obtained; at the same time the fish does not have grill marks or broken skin. The cooking period is practically the same as in other methods and the oil obtained is of better quality and without water. Among the different indirect cookers there are some models that permit continuous operation.

--World Fisheries Abstracts
March-April 1956, vol. 7, no. 2

FLounder--A UNIVERSAL FAVORITE

In discussing the merits of their favorite fish, a westerner may praise his rockfish, an easterner his shad, and a southerner his pompano, but all will agree that no matter where you live, flounder is a universal favorite.

Flounder is nationally-known because it is caught in all our coastal waters and is not only sold fresh but is also filleted, frozen, and shipped to all parts of the United States.

Flounder, a white meated fish with a sweet, rich flavor, is in plentiful supply. It may be prepared by any of the basic cooking methods of frying, baking, broiling, boiling, or in an endless variety of combination dishes.

The home economists of the U. S. Department of the Interior's Bureau of Commercial Fisheries suggest using flounder fillets in "Flounder Turbans."



Flounder turbans.

FLounder TURBANS

2 pounds flounder fillets, fresh or frozen	Dash pepper
1 teaspoon salt	Bread stuffing
	$\frac{1}{4}$ cup butter or other fat, melted

Thaw frozen fillets and skin if necessary. Sprinkle fillets with salt and pepper. Line 12 well-greased muffin tins with fillets, overlapping ends of fillets. Place ball of stuffing in center of each. Brush tops with butter. Bake in a moderate oven, 350° F., for 25 to 30 minutes or until fish flakes easily when tested with a fork. Serves 6.

BREAD STUFFING

$\frac{1}{4}$ cup chopped onion	1 teaspoon thyme, sage, or savory
$\frac{1}{2}$ cup chopped celery	seasonings
$\frac{1}{3}$ cup butter or other fat, melted	Dash pepper
1 teaspoon salt	1 Quart soft bread cubes

Cook onion and celery in butter for 10 minutes or until tender. Combine all ingredients; mix thoroughly. If stuffing seems very dry, add 1 tablespoon water or milk to moisten.

SPINY LOBSTER GEAR AND FISHING METHODS

Fishery Leaflet 487, Spiny Lobster Gear and Fishing Methods describes the gear and methods known and used specifically in the Florida area. Modified versions may be found in other areas since the spiny lobsters' range includes the tropical, subtropical, and some temperate seas of the world. At present, commercial spiny lobster fishing is practiced in Florida, throughout the Caribbean, Central America, South America, Mexico, South Australia, Korea, and other countries of the Far East. Several closely-related species are involved.

To catch the spiny lobster Panulirus argus, Florida fishermen have effectively used several types of gear and fishing methods. Although some of these are now illegal in Florida, they may be permitted in other areas where fishing regulations differ.

Certain factors of spiny lobster biology bear directly on the gear and methods used to catch them. They are taken mainly in waters less than 50 feet deep, although they are known to occur in greater depths. Biologists have studied spiny lobster migrations and have found that they move between inshore and offshore waters as well as along shore during various periods of their life cycles. A knowledge of these movements, as they relate to seasonal, weather, and water conditions of an area, is used by fishermen in planning their operations.

There is little standardization in spiny lobster boat design. Boats used range from 14-foot skiffs, which are rowed or are outboard-engine powered, to motor launches.

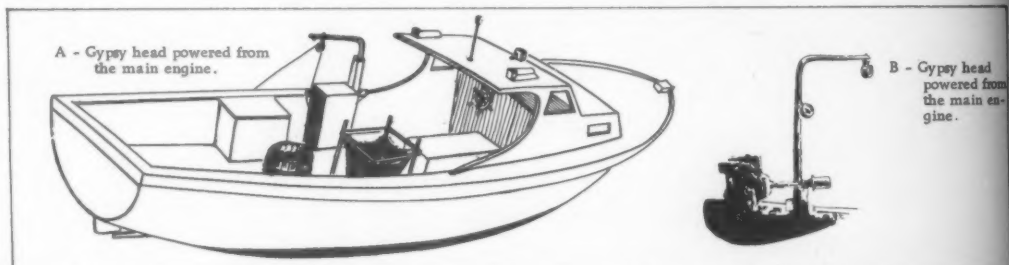
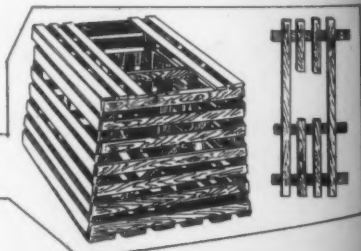


Fig. 1 - A typical spiny lobster motor launch.

The typical commercial launch is wooden hulled, of shallow draft, 26 to 36 feet long, and is powered by an engine of 125 to 150 hp. Diesel engines, marine gasoline engines, and converted automobile engines are used. The Diesel's cheaper maintenance and fuel costs make it the preferred engine, but its higher purchase cost prevents most boat owners from installing it. For this reason marine gasoline engines and converted automobile engines are much more commonly used.

The most popular commercial gear is the wooden lath trap. Florida law limits its maximum dimensions to 3 by 2 feet. Some fishermen build traps to this size; others reduce all dimensions but retain the rectangular shape. Still others reduce top dimensions only, thus forming a flat-topped pyramid (fig. 2).

Fig. 2 - Pyramid-type wooden lath trap with removable lid.



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